COAL AGE

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DEVOTED TO THE OPERATING, TECHNICAL, AND BUSINESS PROBLEMS OF THE COAL MINING INDUSTRY

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"The Coal Trade Blues"

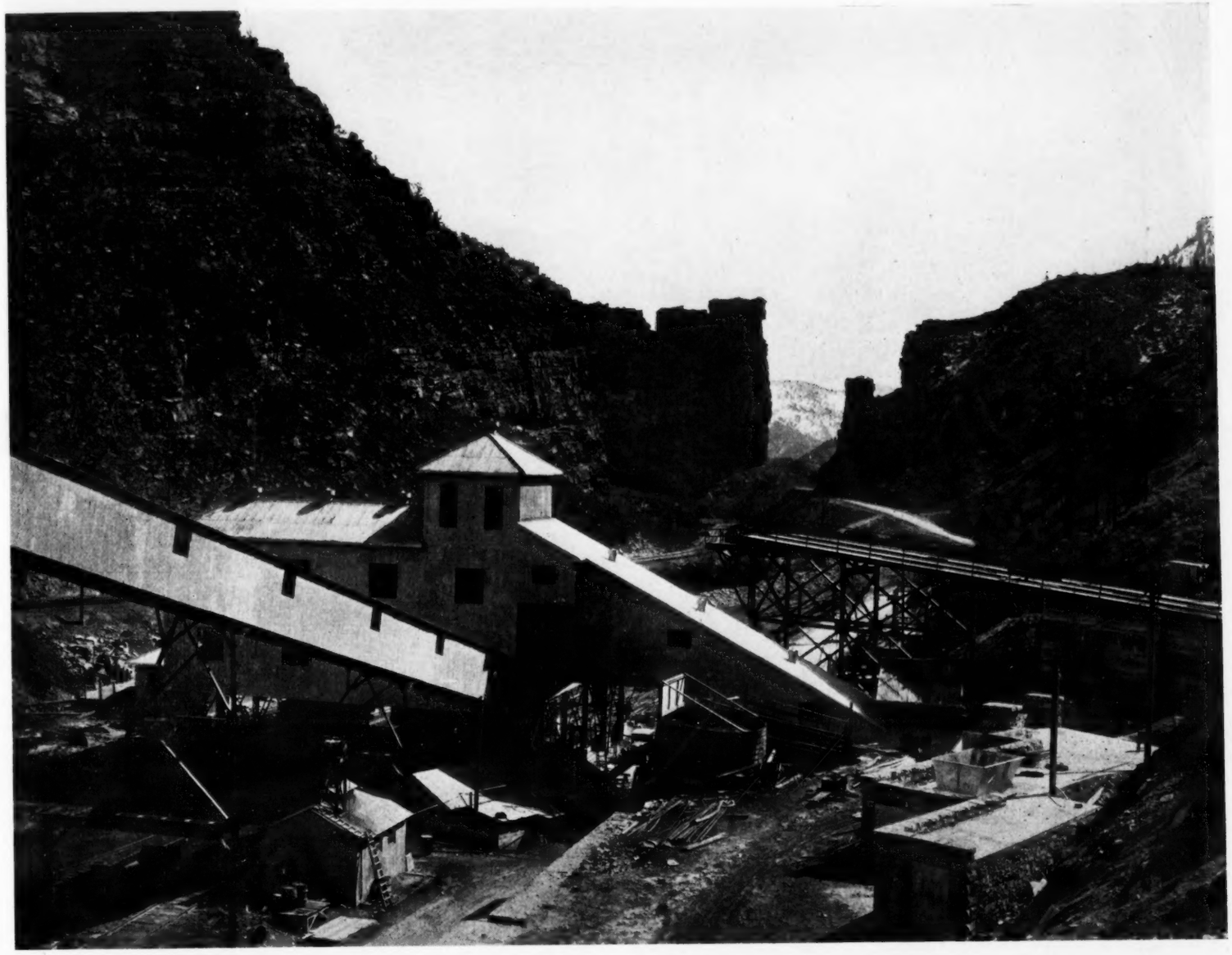
ENJOYMENT of poor health has been so fashionable in the bituminous coal industry that it is not always easy to distinguish between chronic invalidism and hypochondria. In certain districts, the economic situation admittedly is depressing, with neither profits, wages, nor sales volume suggesting early improvement. Diagnosis of the real state of the industry, however, must be as broad as the industry itself. In such an examination, many of the unfavorable symptoms are cancelled out by the more favorable indicia.

THIS cancelling-out process is admirably demonstrated in a review of comparative production figures. Bituminous output to May 17 was only 9.2 per cent under the total for the corresponding period last year —and 1929 was not a bad year from the tonnage standpoint. Moreover, this decrease probably is inflated, because drafts on consumers' stocks the first quarter of 1930 were 2,300,000 tons greater than a year ago.

WHEN comparison is made with other basic movements used in the construction of statistical barometers, the showing is still more heartening. During the first four months of 1930, for example, *The Annalist* combined index of industrial activity was off 12.3 per cent when compared with the corresponding period last year. Bituminous coal, however, was off only 8.7 per cent—with the exception of electric power production, the smallest loss in a list including pig iron, steel ingot, zinc and automobile production, car loadings, and cotton and wool consumption. Pig iron was off 13.9; automobile production, 30.4 per cent.

THAT business is bad in spots is no phenomenon peculiar to periods of depression. But that the volume of coal production should be so well maintained in the face of widespread complaint of postponed return to high-speed general industrial activity points to a degree of stabilization not commonly associated with "exhibit A" in the world's sick industries. The fat-sloughing tortures of recent years have not been without their benefits.

AS previously indicated, this stabilization has not been shared in equally. Some operators who won temporary advantage through wage cuts now face ruinous reprisals. Nothing is more unstable than volume so achieved—or, in the long run, more disastrous. The companies that are making outstanding progress in building for permanent gains are doing so by backing up sound management with the money to keep operations modernized.



Behind the Castle Gate—New Tipple of Peerless Coal Co., Castle Gate, Utah

TIMBER TREATMENT

+ Opens Way to Substantial Savings In Mine Operating Costs

By L. N. THOMAS

Vice-President, Carbon Fuel Co.
Carbon, W. Va.

IN TIMES gone by, much of the timber used in the mines could be obtained from the woods on or adjacent to the mine properties. During the past few years, however, many operators have been compelled to buy most of the wood used for houses, mine ties, and posts. Split mine posts, formerly obtainable from our own property at a cost of about 15c. apiece delivered at the mine, must now be bought from outside at an average cost, including handling, of about 25c.

Possibly 10 or 15 per cent of this timber is used in entries which must be kept open and in good condition for at least ten years. This 10 or 15 per cent has to be replaced, due to decay, several times during these ten years. Four years ago our company built about three miles of outside tramroad, using nearly 9,000 ties—including side tracks. During the past year, practically all of these ties have been replaced, as well as many replacements inside the mine. These ties were 6 x 6 in. x 6½ ft.—mainly of oak—costing approximately 50c. per tie. Due to the scarcity of oak, however, it has often been necessary to take substitutes which last sometimes not over a year or two. The cost of replacement in nearly all cases is higher than the first cost, due to additional labor in taking out the old wood.

Recently our company decided to reopen and recondition a mine which had been closed for about four years. Most of the track in this mine, which was about 15,000 ft. long, had been retied shortly before closing the mine. Upon investigation, it was found that practically every tie in the track had decayed. Because of an earlier unsatisfactory experience with creosote dipping, inquiry was made into present methods of treating timber and the kind of chemicals used. Wolman salts impressed us favorably because this chemical is non-corrosive, insoluble, and has no irritating effect on the skin. Wood treated with it could readily be painted and, therefore, it is possible to use it on lumber for use in houses.

An investigation then was made to determine if a small, economical plant to treat timber with this chemical could be built. There were several angles to this problem. While the plant would have to be large enough to take care of all requirements, it also would have to be small enough to make operation economical. Since the demand on it probably would be more or less intermittent, a plant which could be opened and closed from time to time without additional cost must be had. Simplicity of operation also is necessary, since intermittent demands would make it uneconomical to employ an expert for this particular kind of work. The problem of upkeep also is important, as the total cost of treating wood must be held within certain limits, in order to make the treating of wood cheaper at least than the cost of the wood. If this could be done, then the cost of labor in replacements would be saved. The plant and equipment finally decided upon as meeting these specifications was constructed by the Kanawha Manufacturing Co. and includes a small steel building 24x30 ft.; a retort 54 in. inside diameter by 21 ft. long; three tanks—a mixing tank of 1,500 gallons capacity, a storage tank of 3,000 gallons capacity, and a measuring tank of 400 gallons capacity—an air compressor; air receiver; and a small boiler.

The salt is bought in barrels of 225 lb. each and is dissolved in water in the mixing tank. The bottom of this tank contains perforated pipes which allow jets of hot water or steam, at high pressure, to be forced up through the solution, thus causing the salt to thoroughly dissolve. The wood is loaded onto small cars which run on a track into the retort, after which the end gate of the retort is securely bolted.

If the lumber is green, a process of steam seasoning then takes place. Low-pressure steam is introduced into the retort and heat also is applied by means of steam coils which raise the temperature to about 150 deg. F. After a period of steaming, a vacuum of about 25 in. is drawn in the retort. This process is then repeated two or three times—the time depending upon the kind and condition of wood to be treated. Between the time of steaming and vacuum, valves are opened which allow the retort to drain off sap and any condensed steam which are contained in the wood. The last vacuum is used to pull the solution into the retort and, having filled it, into the measuring tank. The measuring

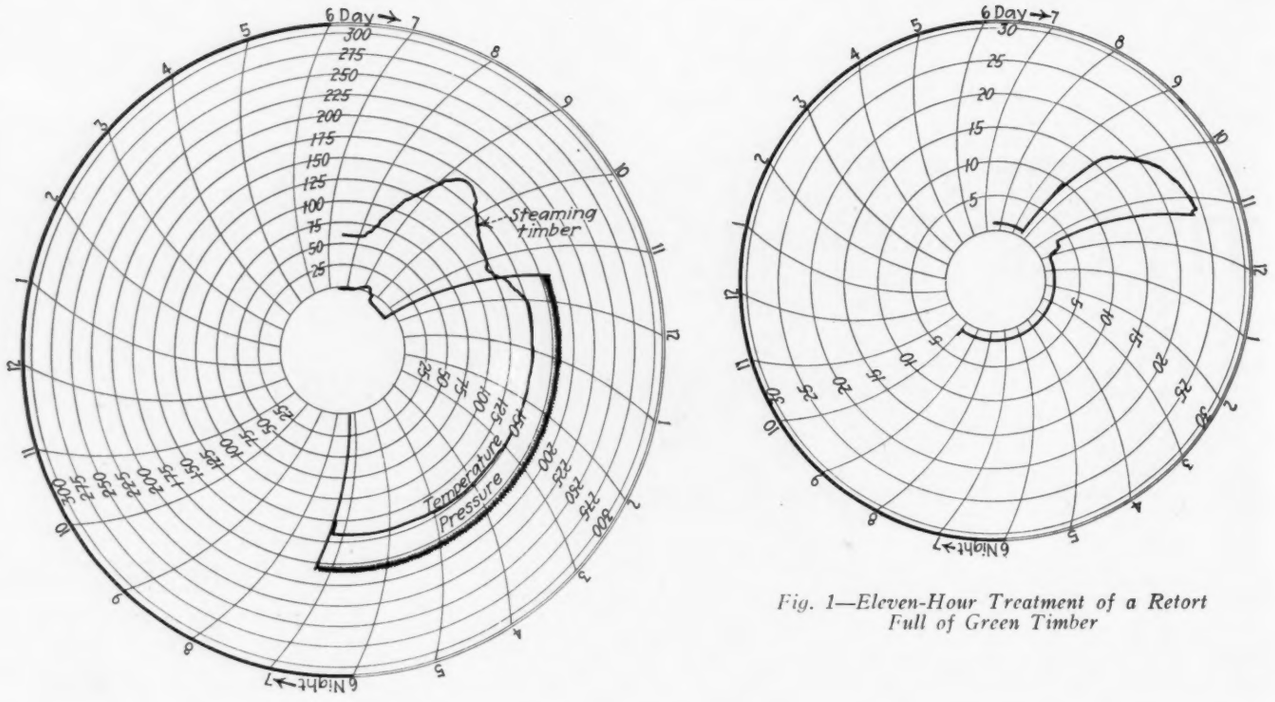


Fig. 1—Eleven-Hour Treatment of a Retort Full of Green Timber

tank has glass gages which indicate the quantity of solution it contains.

Pressure of 175 lb. per square inch is then applied and this pressure is kept on until a predetermined amount of solution is absorbed by the wood. This amount, of course, is indicated on the gages of the measuring tank. After this point has been reached, the pressure is used to force the unabsorbed solution back into the storage tank, where it is kept at a temperature of about 100 to 120 deg. F. by means of a steam coil in the bottom of the tank.

If seasoned timber is obtainable, the steaming is eliminated, it being necessary only to pull a vacuum for about 30 minutes in order to open well the cells in the wood. This will increase by three or four times the quantity of wood which can be treated in a 10-hour shift. Generally, it takes the full shift to treat one retort of green timber, and from three to four retorts of seasoned timber can be treated in the same period of time.

Recording gages for measuring temperature, pressure, and vacuum are used. Typical charts from these meters showing the treatment of seasoned timber are reproduced in Fig. 1. It will be noted that the recording meter was started at about 7:30 a.m. with a temperature of about 60 deg. in the retort. This temperature can be seen increasing until it reaches 170 deg. at about 9:30. Going from here to the smaller chart, the vacuum is indicated, which vacuum reaches 24 in. at about 11:15, the vacuum line dropping sharply to zero.

Referring again to the larger chart, it can be seen that pressure is applied which increases rapidly until, at

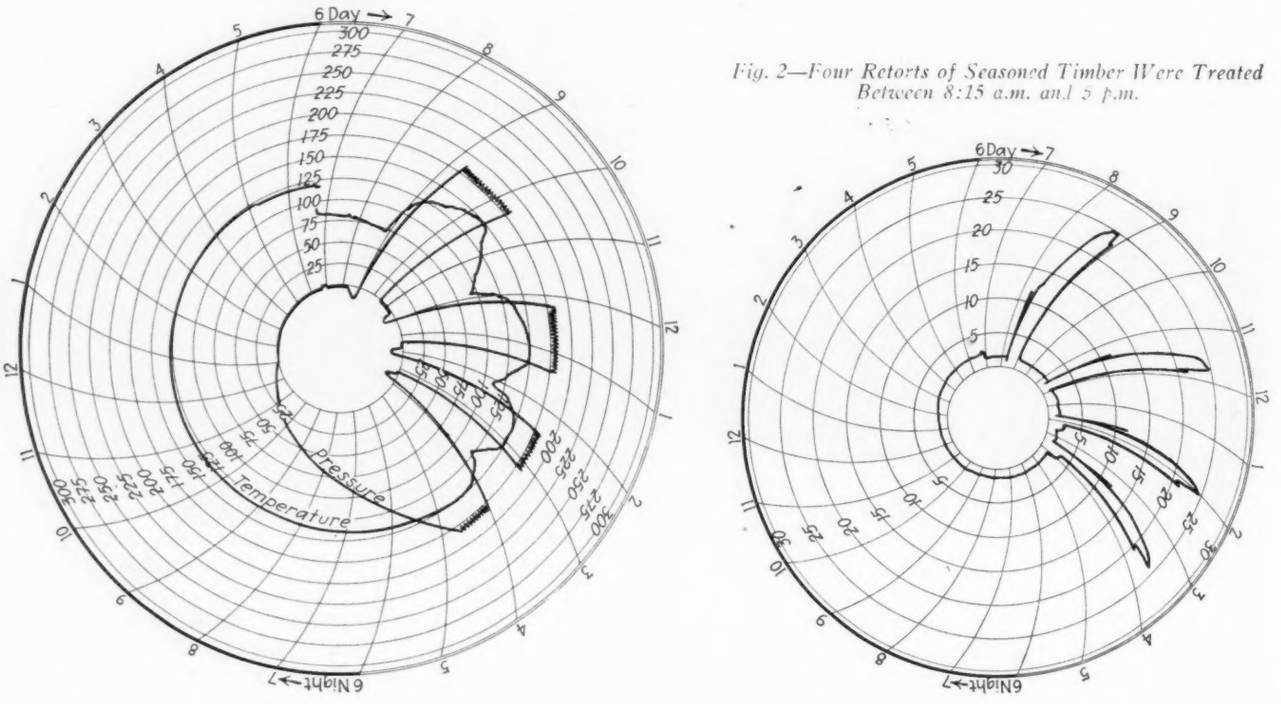
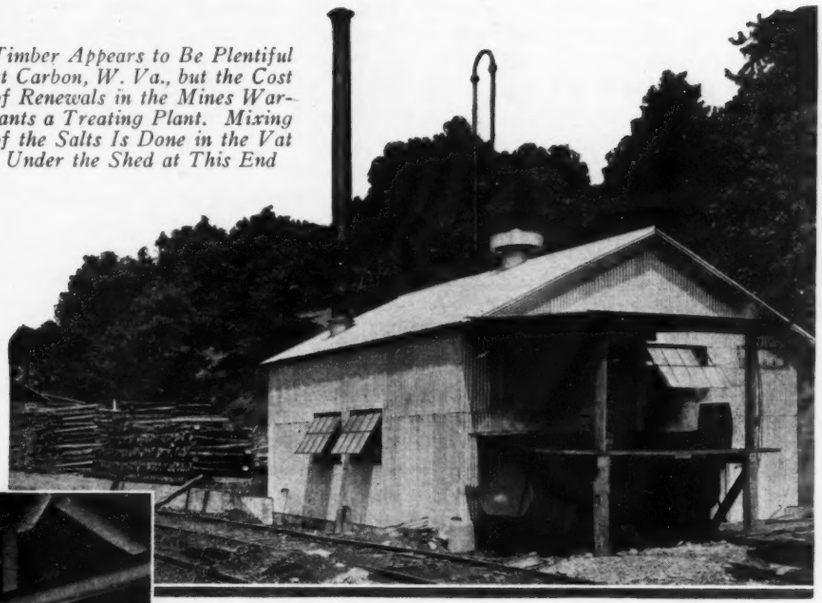
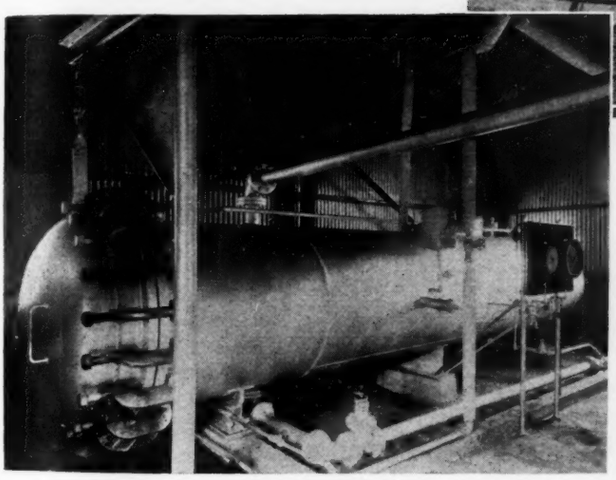


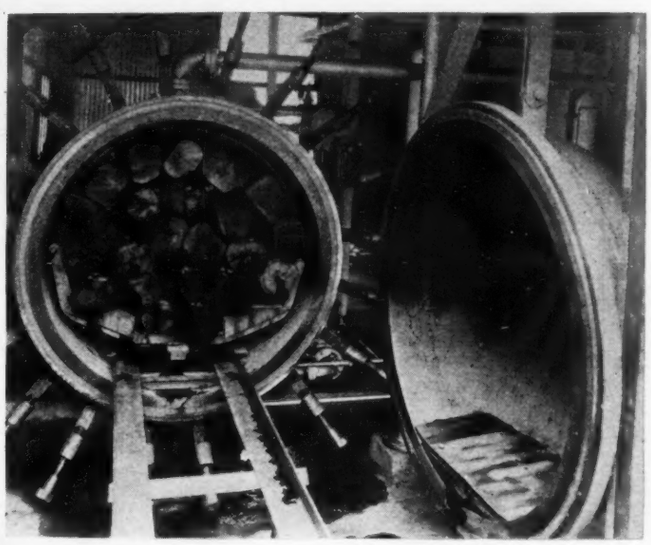
Fig. 2—Four Retorts of Seasoned Timber Were Treated Between 8:15 a.m. and 5 p.m.



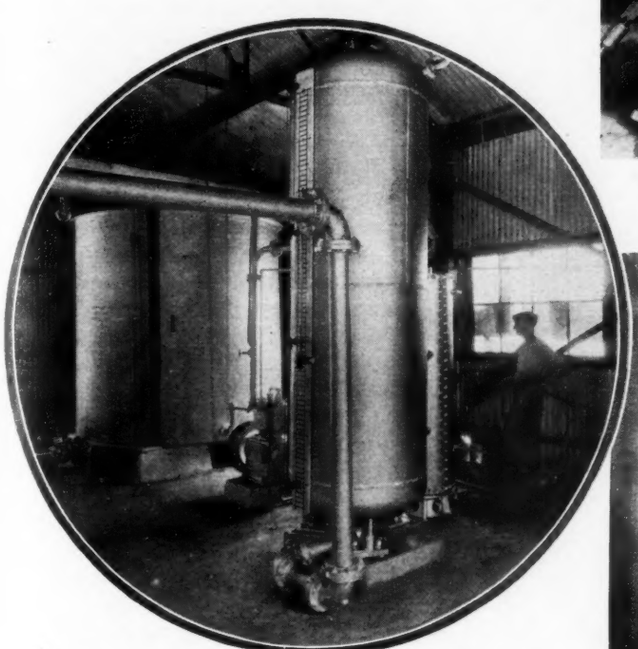
Timber Appears to Be Plentiful at Carbon, W. Va., but the Cost of Renewals in the Mines Warrants a Treating Plant. Mixing of the Salts Is Done in the Vat Under the Shed at This End



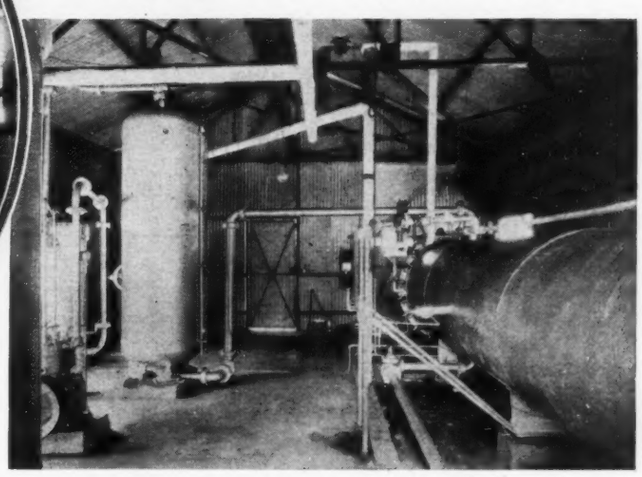
The Retort, Which is 54 in. in Diameter and 21 Ft. Long, Is Subjected to Steam Temperatures, to a 25-In. Vacuum and to a Pressure of 185 Lb. Per Square Inch



Door Open Showing Car and Timber In Retort



Storage Tank at Left, Measuring Tank in Center, and Steam Boiler at Extreme Right



A Floor Space 24x30 Ft. Leaves Room to Spare

11:30, 185 lb. per square inch is reached. This curve follows a zigzag course until about 7:15 p.m. The irregularity in this curve indicates a minimum pressure of 175 deg. and a maximum pressure of 185 deg. during this entire period of time. This is brought about by means of an unloading device on the air compressor. The temperature having dropped off during the period of vacuum rises during pressure to 150 deg. maximum and is held near that point during the entire pressure period. At the end of this pressure period the wood has absorbed the required amount of solution and is ready for discharge from the retort. It will be noted that about twelve hours and a half were required for the treatment of this one retort of green timber.

The seasoned timber charts are shown in Fig. 2. The recording meter was started at 6:45 a.m. with a temperature in the retort of about 75 deg. This shows no application of heat, as the outside temperature is practically the same. Treating started at 8:15, as shown by the smaller chart, which indicates a vacuum rising rapidly until 25 in. was reached at about 8:45. This vacuum, after being held about twenty minutes, drops sharply, as it is used to draw the treating solution into the retort. Pressure is then applied, as shown on the larger chart, which also indicates a rise in temperature to the required 150 deg. This pressure was necessary for only an hour and a quarter, after which time the pressure line dropped sharply as the solution was forced back into the storage tank. The retort then being opened to discharge the timber, allows the temperature to drop, which is shown on the temperature curve, between 10:30 and 11:45. Following these two charts further, it can be seen that four retorts of timber were treated before 5 o'clock, the last batch of timber being allowed to remain in the retort over-night; as indicated by the gradual decrease in temperature and pressure. This latter operation was not necessary.

For mine timber, it is recommended that about ½ lb. net retention of salt per cubic foot of wood treated be obtained. Therefore, the solution is varied according to the length of time necessary for treating the particular kind of wood in the retort. Ordinarily, for seasoned mine ties and posts, we use a 1.66 per cent solution —that is, one pound of salt for 7.08 gallons, or 59 lb. of water. Therefore, for every 60 lb. of solution which is absorbed by the wood, we will have 1 lb. net retention of salt after the water has evaporated out. In order to get ½ lb. net retention per cubic foot of wood, it is then necessary to force in 12 lb. of solution. By computing the total number of cubic feet of wood in the retort and multiplying this figure by 12, we know the quantity of solution which must be absorbed by the wood which the retort contains. When this point is reached, the valves between the retort and storage tank are opened and the pressure forces the solution out of the retort.

For seasoned timber it is generally found that about two hours of pressure is required. For green timber, however, it may take as much as six or eight hours to force this 12 lb. of solution into each cubic foot of wood. Therefore, the labor cost would be materially increased. In order to avoid this, the solution may be richened by using 4.68 gal. of water to the pound of salt, which would make it necessary for the wood to absorb only 8 lb. of solution. This would then bring the pressure period back to approximately two hours.

Depth of penetration also is an important consideration in this process of treating. This is largely determined by trial. Woods such as red oak, beech, sugar, and pine readily absorb the solution and are penetrated entirely through, while white oak is very difficult to penetrate, the solution seldom penetrating the heartwood. Therefore, it is not wise to richen the solution to the point where the pressure period is made too short, for the reason that some woods may take the amount of absorption necessary around the surface of the wood and the center of the wood would be unprotected. A red chemical is pro-

(Turn to page 361)

Fig. 3—This Form Is Made Out in Full for Each Retort-load of Wood. The Information Which Can Be Gotten From This Form and the Recording Meters Which Correspond, Enables Anyone Familiar With Treating to Have an Exact Check on the Operations of the Plant Without Even Being at the Plant.

Charge No.....

THE CARBON FUEL COMPANY

Record of Wolmanizing Operations

Material	1. Kind of Wood (Hardwood, Mixed, Softwood).		
	2. Species (Ties, Post, Collars, Building Material)		
	3. Seasoned.....		Month
	4. Tram 1 Species.....	Size.....	Pieces
	5. Tram 2 Species.....	Size.....	Pieces
	6. Tram 3 Species.....	Size.....	Pieces
	7. Total Volume: Pieces.....	Ft. B.M.:.....	Cu.Ft.
Steaming	8. Started Hour:.....	Vacuum Started Hour:.....	Inches
	9. Started Hour:.....	Vacuum Started Hour:.....	Inches
	10. Started Hour:.....	Vacuum Started Hour:.....	Inches
	11. Started Hour:.....	Vacuum Started Hour:.....	Inches
	12. Started Hour:.....	Vacuum Started Hour:.....	Inches
	13. Steam Pressure: Start, Lb.....	Final.....	Pounds
Impregnation	14. Vacuum Started.....		Hour
	15. Introduction of Preservative Started.....		Hour
	16. Vacuum Ended.....		Hour
	17. Vacuum Maximum.....		Inches
	18. Pressure Started.....		Hour
	19. Pressure Ended.....		Hour
	20. Pressure Maximum.....		Pounds
	21. Temperature in Storage Tank.....		Degrees F.
	22. Temperature in Retort Start.....		Degrees F.
	23. Temperature in Retort Final.....		Degrees F.
	24. Forcing Back of Solution Started.....		Hour
	25. Forcing Back of Solution Ended.....		Hour
	26. Final Vacuum Started.....		Hour
	27. Final Vacuum Ended.....		Hour
	28. Final Vacuum Maximum.....		Inches
Preservative	29. Heights of Solution in Measuring Tank, Start.....		Inches
	30. Heights of Solution in Measuring Tank, Final.....		Inches
	31. Absorption (29–30 × lb. per inch Tank Volume).....		Pounds
	32. Absorption per Cu.Ft. of Wood (31 ÷ Volume of Wood).....		Pounds
	33. Density of Solution.....	Gal. per lb.....	Per cent
	34. Amount of Dry Salt Retention per Charge (Cu.Ft. × per cent Density)		
	35. Amount of Dry Salt Retention per Cu.Ft.		
Summary	36. Steaming.....		Minutes
	37. Initial Vacuum.....		Minutes
	38. Introduction of Preservative.....		Minutes
	39. Impregnation.....		Minutes
	40. Forcing Back of Solution.....		Minutes
	41. Final Vacuum.....		Minutes
	42. Opening Retort.....		Minutes
	43. Total.....		Minutes

44. Remarks:

Operator.....

COAL MINING PROGRESS

+ Keynote of

Rocky Mountain Institute Meeting

PROGRESS in all phases of coal mining, with particular emphasis on accident prevention and mechanization, was the keynote of the twenty-ninth regular meeting of the Rocky Mountain Coal Mining Institute, held at the Hotel Cosmopolitan, Denver, Colo., May 26-28. Transportation as applied both to mines with hand loading and those using loading machines, methods of breaking down the coal face to increase the production of lump, marketing of coal and its influence on realization, preparation methods as applied to coal for the domestic market, and vocational training for miners followed closely in interest created and discussion provoked.

At the session on marketing, on May 26, presided over by B. B. Brewster, Salt Lake City, Utah, C. Price Crawford, fuel engineer, Liberty Fuel Co., Salt Lake City, called upon the coal industry to recognize the advent of a new day. "Cost of production alone is not a measure of profit," he declared. "It is an interesting fact that the production of an article represents a definite loss until that article has been sold for a price in excess of its total cost, and the money is in the hands of the producer. If that is true, then the selling price is more important than the production cost."

Up-to-date machinery and trained men have brought coal-production costs down until only the invention of new machinery offers much possibility of lowering them still further. "It naturally follows that any improvement in our financial condition must come through an increase in net realization on coal sold. Out-of-date methods can, and are, losing dollars faster than the operating departments can save pennies. The only qualification necessary to be a coal salesman has been personality and an inclination to 'meet competition.' In too many cases, 'meeting competition' has meant doing as many foolish things as a competitor does."

However, "if the future welfare of the coal industry is dependent upon

B. W. SNODGRASS

the selling end, our sales departments must include men with the same measure of training and ability now demanded of the operating personnel. Sales managers, in particular, should be grounded in combustion at least, so that they may train and assist the salesmen of their organization."

A progressive sales policy, Mr. Crawford declared, can go far in reducing losses in collections; improving service, and thereby reducing competitive inroads, and in furthering the sale of small sizes. As for the latter, "the present differential in price between lump and nut is not justified by any difference in value." Treating coal to render it dustless furnishes a still further opportunity for the sales department to increase profits.

H. C. Marchant, general manager, Pinnacle Kemmerer Fuel Co., Denver, Colo., maintained that Colorado will not be able to market more than 9,500,000 to 10,000,000 tons of coal annually for the next three to five years. With the increased use of gas, oil, and other substitutes for coal, the normal increase of sales in the coal-burning territory east of Colorado will be largely nullified, unless the competitive situation in that region is more nearly met.

"This brings us to the second phase, 'the mine price,'" said Mr. Marchant, "which depends upon the cost of production, and this in turn upon efficient operation." When the railroads were released from federal control, stated Mr. Marchant, they were given the choice of two alternatives; either to furnish the public with efficient, safe, and punctual transportation, and the shipper with adequate supply of cars, or go back into federal control. They elected to meet public demands. The railroads accomplished this not by increasing the number of employees but by efficiency, scheduling, and time study. Today they are moving more freight than at any time in their history, yet the number of employees has been reduced by 175,000. To have alleged the possibility of wide improvement in railroading would, in 1920, have brought the retort, "It can't be done." That it can be done is attested by the bettered financial position of the carriers today.

Coal mines are faced with the

DISPATCHER'S WORK SHEET

MAIN HOIST			SLOPE HOIST			BACK-SLOPE HOIST					A & B PANEL HOIST					TIPPLE			MAIN PARTING			NO. 8 PARTING			MATERIALS & SUPPLIES			MINING MACHINES				CONVEYORS				DRILLERS		
Lv.	Ret.	Remarks	Lv.	Ret.	Remarks	Lv.	Cars	Ret.	Cars	Remarks	Lv.	Cars	Ret.	Cars	Remarks	Loads	Empties	Remarks	Loads	Empties	Remarks	Loads	Empties	Remarks															
																5	15		10	20		0	9															
7:01	7:19		7:29	8:30		7:45	2	8:23	2		7:59	5	8:13	3		0	15		5	15			2					#1	7:45	4-7-9					7:45	#1		
7:49	8:01		9:11	9:19		9:11	4	9:31	2		9:19	3	9:41	3		0	15		0	10			7												7:45	#2	4-XCut	
8:19	8:21	Waiting for cars																	0	10																		

same problem and have as good a chance for success as the railroads. A transportation system at the mines is a miniature railroad. The coal loader is the shipper and should be given ample car service. To accomplish this end, scheduling of all operations is required, and scheduling means dispatching.

The first impression is that scheduling would take an army of company men; that if a loader does not load coal during all eight hours of a shift, a man cannot be stationed in his place to see that he does. Scheduling actually requires fewer men. The company set a minimum and an average tonnage that a loader is expected to produce in eight hours. If, at the end of a shift, check numbers show that certain men have fallen below the standard, an investigation is made to determine the cause. If the company has failed in its service, the fault is corrected. If the loader happens to be one of those who enter the mine for the winter with the idea of loading just enough coal to pay their board and get a little spending money, he is given his time. An operator cannot afford to keep a loader who produces 4 or 5 tons from a working place that should yield 8 or 10 tons per shift.

The dispatcher is located at the main parting and everyone entering or leaving it must pass his station. As the rope riders and drivers pass the dispatcher's station at the end of the shift, they leave a memorandum recording the location of all loads and empties. The machine runners similarly give the location of their machines. Timbermen and tracklayers leave a record of material needed, where they are needed and also the location of poor track or places needing timbering. A blueprint of the mine is mounted on a board and colored tacks are used to designate the location of individual loaded and empty cars, trips, and faces being worked.

A TYPICAL report of a rope rider follows: "Rope Rider B panel—empties in rooms 1-2-8-11; loads in 2-4-9-10; 2 loaded trips and one empty trip on No. 8 parting." Tacks are immediately placed on the map to visualize this information, and it is a matter of only a few minutes until all cars are thus located. On arriving at No. 8 parting with 5 cars, the rope-rider immediately reports to the dispatcher the arrival of the trip consisting of loads from Nos. 6, 7, 8, 10 and 12 rooms and his intention of returning with 3 empties. If the dispatcher wants any special distribution of these 3 empties, he so instructs the rope-rider; if not, the latter is allowed to use his own initiative.

While the fundamentals of a day's operation are somewhat similar, the details are subject to quick and radical change, which accounts for the need of a control station to handle each situation. This does not pertain solely to the movement of pit cars but is equally important in the handling of material, track laying, timbering, wrecks, pumping, and similar work. Outside operations are kept in as close touch with the control station as those on the inside.

A mine automatically divides itself into districts, generally into entries or panels, as each district is operated with specific motors, hoists, drivers, mining machines, timber and track crews. Therefore, it is merely a matter of detail to arrange an operation study for determining what improvements should be made in each district.

A tonnage map is needed for this study. Take a blueprint of the mine, mount it on a suitable board, and spot the faces being worked. At the end of the shift, post the tonnage that each place produced that day. If this seems too big a task, post the tonnage weekly or semi-monthly. In a few days the weak district will stand out like a sore thumb and call for investigations to find out whether the company or the miner is at fault. Post this map where men responsible for the production can see and study it. This scheme will bring surprising co-operation from these men. It will soon be discovered, after the study is started, that avoidable delays are susceptible to marked improvement, also that the necessary changes involve the outlay of little or no money.

"Consolidation of individuals," instead of their assets, was proposed by Mr. Marchant as a means of effecting co-operation and curing many of the ills of the industry. Operators must learn to broaden their view and look at the situation not from their own standpoint but from that of the industry as a whole.

Systematic timbering as a means of preventing accidents from falls of roof and coal was the major theme of the safety session in the morning of May 27, with President B. W. Snodgrass presiding. "The fact that in almost every locality approximately 50 per cent of the accidents are caused from 'falls of roof' shows they have this point in common," declared S. H. Ash, mining engineer, U. S. Bureau of Mines, Berkeley, Calif., "and it is natural to conclude that the remedy also is a combination of factors that can be summed up and applied in all instances to cover the situation as a whole." Systematic timbering, he asserted, offers the solution for the problem.

THE most important causes of accidents from falls of rock and coal, said S. S. Temple, superintendent, Cameron Mine, Colorado Fuel & Iron Co., Farr, Colo., are: lack of definite systematic timbering; inadequate supervision and laxness on the part of officials charged with this work; failure to instruct the workers in regard to rules made for their safety; neglect in following up accidents to definitely determine their cause as a means of avoiding repetition, and poor discipline and failure to post definite penalties for violation of rules. Systematic timbering, he declared, will correct the tendency of miners to be lax in regard to their personal safety.

"There is no question about a safety program being expensive," stated a paper by V. O. Murray, safety engineer, Union Pacific Coal Co., Rock Springs, Wyo., and read by G. A. Brown, superintendent of that company. "It is, as it produces no commodity, but when properly organized and with a definite goal, it will pay a dividend by increasing the efficiency of the human worker." His presentation, and other papers read at this session are treated more fully beginning on page 368 of this issue of *Coal Age*.

Methods of breaking down the coal face were discussed at the afternoon session, presided over by F. C. Miller, chief chemist, fuel department,

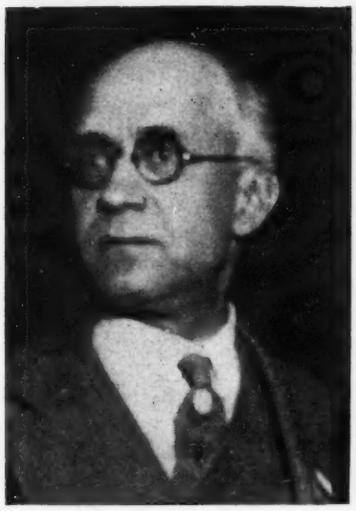
Colorado Fuel & Iron Co., Trinidad, Colo. Following a paper on Cardox blasting written by Frank A. Manley, engineer, Safety Mining Co., Chicago, and read by L. R. Douglas, superintendent, Fraker Coal Co., Denver, Colo., Senator F. R. Wood, president, Temple Fuel Co., Trinidad, Colo., summed up the results obtained from the use of Cardox at the Broadhead (Colo.) mine of his company. The system has been in use there since August, 1929, Senator Wood stated, in very friable coal 3½-4 ft. thick. With black powder, the lump percentage, over a 3-in. screen, was 35. To cut the cost of production and get the mine out of the red, it was decided to install conveyors. But these were found to be unprofitable when only one cut a day was loaded out, and the company turned to Cardox, which would allow blasting while the men were in the mine.

THE initial expense to install the system was $7,000. At first, the older, 4-in. cartridge was used, and it was found that the cost of drilling was as much as the cost of undercutting. After three months, the new small cartridges were obtained, with the result that drilling costs are now no higher than with permissible explosives. A special drill was bought, which puts in a hole in 3 minutes.

Shooting costs are now the same as with explosives, except for the cost of the material, and the total cost is about 100 per cent greater, or 12c. per ton. The great advantage of the Cardox system, Senator Wood said, is that it allows entries to be double-shifted, with an advance of 24 ft. per day. Total cost of driving entries with conveyors and Cardox is 75c. per ton of coal in the pit cars.

Cardox-blasted coal does not deteriorate in shipment, he asserted, and the company now feels that it will be able to market a 3-in. lump instead of the 6-in. lump and 6x3-in. egg previously sold. Under present mining conditions, one conveyor crew in two rooms is expected to load 100 tons per day. During the shift, a total of eight holes is shot, with a production of 12½ tons per hole. Lump increase is expected to be between 10 and 15 per cent.

Use of the expanding bar for breaking coal faces down mechanically in the mines of the Victor American Fuel Co. was described by F. W. Whiteside, chief engineer, Denver, Colo. His presentation is abstracted beginning on page 357 of this issue of *Coal Age*. Following the reading



Benedict Shubart

of the paper, James Cameron, superintendent, Chandler mine, Chandler, Colo., gave the results of three "shots" made with the device. These are set forth in the following table:

	May 12, 1930	May 17, 1930	May 24, 1930	Average
Quantity broken down, lb.	41,100	45,300	47,700	....
Lump, per cent.	64.2	60.9*	63.1	62.7
Nut per cent.	9.0	10.8	9.8	9.9
Slack, per cent.	26.8	28.3	27.1	27.4

*Coal broken up after "shooting."

Presentation of the Joseph A. Holmes Safety Association award to the Shamrock Coal Co., Erie, Colo., for its exceptional record in safety followed the technical session Tuesday afternoon. E. H. Denny, district engineer, U. S. Bureau of Mines, Denver, Colo., awarded the certificate, which was accepted for the company by P. H. Powers, president. The Shamrock mine of the company operated from 1914 to 1929 and produced 870,000 tons of coal without a fatality or serious injury to any employee. In accepting the award, Mr. Powers ascribed his record to good natural conditions and the unfailing efforts of the management.

Mechanical loading held the center of the stage at the morning session on May 28, presided over by Mr. Brewster. "Few mines operating today have been opened with the intention of mechanizing throughout," declared William H. Woodhead, superintendent, Independent Coal & Coke Co., Kenilworth, Utah, whose paper was read and supplemented by C. J. Schafer, engineer, Goodman Mfg. Co., Salt Lake City, Utah. "The problem of mechanization is to change over a mine heretofore operated by hand methods, and select machinery that will fit the old system with the least number of changes."

Fundamentals of the choice and operation of loaders were discussed by Mr. Woodhead and their application at the Aberdeen and Kenilworth (Utah) mines of the company described. At the above mines, with a 16-ft. seam, the lower 8 ft. of which is extracted on first mining, and 24-ft. rooms, the average of each crew on the power shovels is 215 tons per nine-hour shift, with an average delay of 10 per cent, Mr. Woodhead declared.

Transportation problems in machine loading and how they have been met at the Acme and Monarch mines of the Sheridan Wyoming Coal Co., were discussed in a paper by R. E. Miller, assistant general superintendent, Kleenburn, Wyo. The seam mined is the Monarch, which is 18 to 50 ft. thick. It does not dip excessively and requires no timbering. Conditions generally being favorable, the big problem of mechanization at these mines was one of transportation. Only slightly secondary was that of power supply.

THE ROLE of power in machine loading is reflected in periodic additions made to the motor-generator capacity in the last five years at the Acme mine. This mine originally was equipped with two 150-kw. motor-generator sets. With the introduction of loading machines, 450 kw. was added to the motor-generator capacity. Later, it was found that the addition of 150 kw. to that already installed was necessary to insure an ample supply of power for machine operation.

Entries are developed by the Joy machines according to a system which employs locomotives for shifting cars. In the mining of rooms, Goodman power shovels are used, the shifting of cars behind each machine being done by two horses over a double-track layout. A third horse handles empties between rooms and partings. Shifting cars by horses is a heritage of hand-loading days, but the continuance of this practice is justified, Mr. Miller asserted, as replacing horses with battery locomotives "would require quite an investment, and the cost of operation would not be much cheaper."

Main-line tracks are laid with 60-lb. steel on 6x8-in. wood ties on 2-ft. centers. Where there is a possibility of the track spreading, as on curves in main haulageways, steel ties are used. Temporary entry tracks and those in rooms are laid with 20-lb. rail on steel ties. Cross-entries

are tracked with 30-lb. rail on 5x5-in. wood ties. All room tracks are fish-plated and bolted. The use of steel ties for the purposes outlined above is virtually a necessity and loss of ties by breakage is negligible.

Mine cars of 3,400-lb. capacity, equipped with roller-bearing wheels, were formerly used with hand-loading. These were rebuilt to a capacity of 6,000 lb. for machine loading. Two years ago, composite cars with a capacity of 6,300 lb., when loaded by machine, and equipped with roller bearings were installed. The money invested in the new cars was held to be well spent and the type adopted as a standard. Because the steel sides in the composite cars are much thinner than the oak sides of the wooden cars, the former type is lighter and holds more coal. The composite type also requires less maintenance. In over two years not one of the composite cars has had to be sent to the shop for repairs. Further details of the Sheridan Wyoming company's machine-loading practice were given in *Coal Age,* Vol. 29, pp. 151-154.

Progress of the Victor American Fuel Co. in mechanical loading with Joy loaders and conveyors was detailed by F. B. Thomas, superintendent of machinery, Denver, Colo. Four Joy loaders were purchased in 1923 for use in a Routt County (Colo.) mine of the company, and were operated successfully until the section in which they were placed was worked out. Bad roof and other unfavorable conditions prohibited their use in other sections of the same mine, so they were removed to another mine and used in driving entries. More development was attained and the cost considerably lowered. The machines are still in use, though to attain best results the coal has to be broken up more than in hand loading, thus increasing the fines.

Experience demonstrated that loading machines were not generally applicable to the mining requirements of the company, largely because of the increased production of fines. On this basis, the company began experimenting with conveyors. Though believing that this type of machine is more adapted to long-face mining, the company devoted its energies to the development of this equipment for room and pillar work because of the previous training of the men in this system and mining conditions peculiar to the Rocky Mountain district.

Two types of conveyors have been developed by the company, one of which is of the unit type designed to load trips of five cars without uncoupling. It is about 60 ft. long, has a capacity of 50 tons per hour, and is driven by a 7½-hp. motor. This conveyor remains in a single place and advances simultaneously with the face. It sets alongside of and parallel with the track and discharges at right angles into the cars, the point of discharge being 41 to 61 in. above the rail.

Twenty feet of the 60 ft. next to the face is pivoted to the rest and the front end lies on the floor. The front end, which is 6 in. high, can be swung from one side to another over a width of 24 ft. A car puller is supplied for handling trips, and the machine is portable back and forth parallel to the track. Because of the expense of setting up and dismantling, it cannot be economically used in places having less than 1,000 ft. advance. Reduced loading and haulage costs have been obtained through the use of these conveyors and the production of fines was decreased 4 per cent.

The Jones flexible conveyor (*Coal Age,* Vol. 33, p. 156) also was developed by the company, and operations over three years with this machine in pitching seams in Routt County have been good. Results from another installation in operation two years at Delagua, Colo., have not been so satisfactory, due to mechanical difficulties.

"Mechanical mining requires radical changes in practices that have been carried on for years," Mr. Thomas asserted, "especially with respect to paying labor. It will be almost necessary that all labor be paid by the day; the tonnage and yardage method of paying will not work out satisfactorily. In our own short experience, we have paid all men by the day, and the results obtained are encouraging. In the beginning, it seemed hard to get the men to do a reasonable amount of work for a day's pay, but we are finding that the men are becoming reconciled to the scheme of things and, in most cases, we are experiencing good results. We anticipate less difficulty in that respect as time goes on and as more men become accustomed to the practice.

"Difficulty is experienced in training men, and particularly foremen, in cycle operation; that is to say, in planning to have certain work done at certain times and by certain men. But that difficulty is rapidly being overcome and we anticipate that mechanical mining will be as systematic as a lot of other industrial activities which are carried on in a systematic manner."

Discussion following the presentation of the papers on mechanical loading was mainly on the point of wage payments brought up by Mr. Thomas. President Snodgrass declared that the custom of paying by tonnage rates should be discouraged, as day rates will get as good results and put all men on the same basis. Uniformity is the desideratum. If the system were universal, the tonnage per man would be as high as under contract work. He admitted that it will take some time to bring about this change.

Benedict Shubart, Denver, Colo., secretary of the institute, said that one of the coal industry's troubles is the contract system. By its use, he

(Turn to page 353)

Rocky Mountain Leaders

G. A. Kaseman, president, Albuquerque & Cerrillos Coal Co., Albuquerque, N. M., was elected president of the Rocky Mountain Coal Mining Institute for 1930-31 at the twenty-ninth regular meeting in Denver, Colo., the last of May, succeeding B. W. Snodgrass, president, Victor American Fuel Co., Denver. Benedict Shubart, Denver, was re-elected secretary-treasurer. Vice-presidents were chosen as follows: Colorado—Frank R. Wood, president, Temple Fuel Co., Trinidad, Colo.; Wyoming—R. E. Miller, assistant general superintendent, Sheridan Wyoming Coal Co., Kleenburn, Wyo.; Utah—G. A. Schultz, general superintendent, Liberty Fuel Co., Latuda, Utah; New Mexico — Sharp Hanson, president, Gallup Southwestern Coal Co., Gallup, N. M.

Members of the executive board for the coming year are: Colorado—G. A. Fruth, president, Aztec Coal Mining Co., Denver, and Robert M. Medill, superintendent, Moffatt Coal Co., Oak Hill, Colo.; Wyoming—J. E. Edgeworth, superintendent, Lion Coal Co., Rock Springs, Wyo., and G. A. Brown, superintendent, Union Pacific Coal Co., Superior, Wyo.; Utah — David Brown, superintendent, Spring Canyon Coal Co., Spring Canyon, Utah, and W. N. Wetzel, superintendent, United States Fuel Co., Mohrland, Utah; New Mexico—G. C. Davis, general manager, Phelps Dodge Corporation, Stag Canon Branch, Dawson, N. M., and H. F. Mills, superintendent, Mutual Coal Co., Gallup, N. M.

BUILDING PERSONNEL

+ For Mechanized Mining

By WALTER M. DAKE

Consulting Engineer
Joy Manufacturing Company

THE most significant fact of our modern industrial civilization is that no machine is complete in itself, but must be supplemented by knowledge in the minds of its users. The usefulness of each product of this machine age is, therefore, directly affected by two factors. One is the efficiency of the mechanism itself, and the other is the knowledge or understanding of the application of this mechanism which exists in the minds of its users.

Viewed from the standpoint of the manufacturer of labor-saving devices, the two factors are of equal importance. The first calls for the highest type of specialized knowledge, analysis, and training in design and construction; the second relies upon the ability of the operator's mind to grasp the full possibilities of the finished unit and apply it in the scheme of industrial evolution for a particular economic result.

Though sporadic attempts were made to utilize different types of cutting, transporting, and loading machines many years before successful installations were effected, general development and application of these labor-saving devices have been invariably preceded by intensive studies of existing conditions. Results of such studies have been reported and discussed by analysts, technicians, manufacturers, and successful users, until the publicity given these studies has grown into a widespread educational movement for the betterment of industry.

Education and training are the main factors of industrial advancement. During the past ten years, the coal industry has gone through the initial stages of economic readjustment in all its branches, and now the basic foundation of education and training is being reflected in improved methods of production, preparation, and marketing to such an extent that known results can be taken as proved guides for future development.

Experiences of the past seven years in the manufacture and installation of mechanical loaders have developed the following principles in training men for mechanized mining: Primarily, the officials and executives of a company contemplating mechanization must be completely and thoroughly convinced of the economies possible by modern methods. They must be in accord as to the general policy adopted; whether this comprises the purchase and installation of a single unit for observation and the collection of operating data, or the rapid and complete mechanization of the entire property.

Many mechanization failures are directly traceable to an implied or expressed doubt of economic results, or to the lack of a well-defined and workable plan between the officials and executives of a company. Experience has shown that it is much better to delay indefinitely the adoption of modern production methods until complete accord can be obtained between officials and an exact method of procedure outlined and adhered to by the executives.

Having a predetermined general policy, the selection of the operating organization must be made with as much care as has been given all variables of mining conditions to be encountered, for, as certain mechanical units are limited by existing physical conditions, ultimate operating results are limited by the capacity of the organization to visualize and put into practice the full possibilities of the mechanical unit.

As entire responsibility, both below and above ground, rests upon the superintendent, he must be selected for this position not only on account of his knowledge of men, his executive ability, and practical experience, but also on account of his aptitude toward changing processes and systems, and, particularly, his skill and talent in collecting and correctly analyzing the mass of facts and figures necessitated by the more scientific methods of modern coal production.

Though the field for the technically trained superintendent, foreman, and face boss offers great possibilities at this time, and particularly for the future, it has been found that the "technically minded" practical man is successfully handling mechanized operations in all sections of the country. As the working meaning of "mechanization" is "co-operation," from the standpoint of both machine units and personnel, and as the test of any chain—whether composed of human blood and bone or steel and energized wire—is the strength of its weakest link, the ability to analyze and eliminate faulty links is the main objective of industrial education and training.

All foremen reporting to the superintendent should be men with well-rounded practical experience, open minded as to the application of modern methods, and with a natural ability for leadership. Direct responsibility should be placed on these foremen for given tonnage productions and costs from their main sections of the mine.

Face bosses should be selected from men in the company who have shown their initiative and ability in the different phases of operation. They should be familiar from the practical standpoint with all of the different kinds of work found necessary to make up the complete cycle of each

mechanical unit. The usual practice is to assign one face boss to each machine crew. In some instances, it is possible to assign two machine crews to each face boss, particularly after the initial stages of mechanical operation have been effected. Face bosses should be given direct authority over complete mechanical units and should have control of the entire operating cycle, including cutting, drilling, blasting, loading, transportation to the main parting, track laying, timbering, drainage, and ventilation for the section.

Loading-machine runners are generally selected from members of the organization who have shown mechanical tendencies and, usually, the best runners are found to be cutting-machine men, motormen, and mechanics. The crew should be so organized that all men attached to a mechanical loading unit will be able to work by progressive stages through the various jobs in that unit to that of loader operator; and from loader operatives should be selected the future face bosses of the company.

AS IN any other type of continuous high-duty production a mechanical loader crew is only as strong as its weakest member, and no hesitancy should be shown in changing operating personnel where it has been proved that certain parts of the operation are being held up through the failure of any member of the crew.

The mechanical repair and maintenance crews must fit closely into the plan of organization. Consistent running time of units can either be maintained through adequate report systems, with properly timed adjustments and repairs, or considerable portions of working shift time can be consumed by minor breakdowns and unnecessary mechanical delays. It has always been recommended that the master mechanic, if possible, and the men who will have direct charge of machine adjustment and repair, be sent to the factory for actual assembly work on the units purchased by their company, as this method gives them first-hand information on the detail design and construction of the machines. Manufacturers' representatives are always available for assistance in the matter of making up inspection and repair report forms, and to explain in detail the best method of field maintenance of their units.

When a skeleton organization has been selected for the initial installation of machines, the key men, consisting of superintendent, foremen, face bosses, and mechanics, should be given every opportunity to obtain general information pertaining to the modern method of production which will be employed. This general information can be passed on by marking special articles in current technical journals dealing with the subject for the personal attention of each man, and by discussion of various points brought out by the manufacturer of the selected equipment.

In addition to a general study of the subject, visits should be made by the key men to properties having more or less similar physical conditions and in which the particular type of units chosen for their own installation are being used. This method of direct observation usually will clear up any specific doubt or any point of particular interest to members of the operating organization.

WALTER M. DAKE

Had a varied experience in the metal-mining field before he entered the coal industry. Born in Nashville, Tenn., Oct. 15, 1886, educated in private schools in that city and in Lawrenceville, N. J., he received his technical training at Vanderbilt University. His first hard-pan contact with industry, however, came in 1903 in Colorado, and that state, Nevada, California, Oregon, and Mexico were the scenes of his further practical training in the metal field from 1903 to 1917. His first direct connection with coal came through his employment as confidential engineer for F. L. Rains, of Salt Lake City, Utah. From reporting for Mr. Rains on coal properties in Wyoming and Utah, a mine superintendency was the next step. He was appointed superintendent of the Blazon Coal Co. in 1918 and promoted to general superintendent of that company and the Carbon Fuel and Morton Coal companies the following year. In 1920 he was made general manager of the Rock Springs Coal & Mining Co. The next year he organized the Dake Engineering Co. When the U. S. Coal Commission was created, Mr. Dake became administrative assistant with that federal body. He joined the Joy Manufacturing Co. as consulting engineer in 1924.

Before the actual installation of machines, all data pertaining to the physical characteristics of the property (as reported with recommendations by the manufacturers of the type machines selected) should be placed in the hands of the key men of the operating organization. All contemplated changes in methods should be discussed and the manner of change agreed upon.

Initial installation of machines should be made slowly; that is, at a rate not greater than an agreed percentage of total production output per month. Also, the absorbent power of a property is limited by the physical conditions encountered as well as by the ability of the operating organization to visualize and put into practice the full possibilities of the units. These points must be determined.

IT IS common practice to install two machines simultaneously, and factory representatives who are thoroughly familiar with the unit itself and who have had varied experience in many fields, are sent to the property to train the operating crews. The first few days usually are spent in familiarizing those selected for runners with the actions of the machine itself: first, by observation of the manufacturer's demonstrator, and then by actual handling of the controls.

In the meantime, the section of the mine designated for installation is studied by the manufacturer's representative, local foremen, and assistant foremen, to note the peculiarities of each working place as to face preparation, track location, timber clearances, point of car change, location of empty and load pit-car storage, and as to other factors.

Though many useful suggestions can be given by the factory demonstrator, who is fitted by extensive training and wide experience in mechanical installations, the exact detail of these applications must be worked out by the local organization, who are familiar with the particular requirements of the property, and with which the demonstrator must become acquainted. Preliminary report forms fitting specific mine requirements should then be worked

out for foremen and face bosses, in order that the main items of delay can be consecutively noted from shift to shift.

During this initial period, it is very necessary for the operating management to hold meetings of the superintendent, foremen, face bosses, and machine runners with the manufacturer's representative, in order that the different points of operation may be brought up for discussion, and individual methods applied. Though the need for joint meetings of operating personnel is greatest during the initial stages of installation, it has always been found desirable to continue these meetings as a regular part of a modern production program. A specified time for a general discussion by all parties concerned will form the desired habit of individual and group analysis of operating problems. These meetings should never be more than two weeks apart, and the time given to them will be more than repaid by gradually increasing production efficiency.

When the organization has been generally co-ordinated and results are beginning to be obtained, the use of time-study analysis of operation should be instituted. It usually is best to have a man not directly connected with the operating crew take the time studies for one or two shifts on each machine, and, as has been pointed out before, the results should be tabulated and analyzed for lost time in the different phases of operation.

The mere taking of time studies usually will show, for that particular shift, an increased tonnage output due to the mental reaction on the crew. However, the only manner by which increasing efficiency can be obtained is through the correct analysis of these time studies, and the actual changing or modification of conditions shown as affecting total mechanical operating time.

IN SOME instances, it has been found effective to translate the time studies into terms of dollars and cents per operating minute, and in this manner bring to the attention of face bosses and foremen the waste in actual money value due to incorrect practices. The continued use and discussion of time studies at the regular meetings usually will bring out new ideas and methods of co-ordination which will result in increased efficiency.

Where educational and training methods have been adopted and adhered to, production per man employed has steadily increased and costs decreased.

The final result of the above outlined methods can be shown by many operations where complete mechanization has been in effect for some time. Records exist which prove increased tonnage output per man employed, under unchanging mining conditions, from year to year, and with the same type and number of mechanical units installed.

It is well to note that improved mechanization practices are being evolved and put into use with every increasing ton of mechanical coal produced, and that progress in this field will be maintained only by the interchange of ideas and experiences for the betterment of the industry as a whole. Anyhow, what is education but systematic development of knowledge; and what is training but the concentration of this knowledge for a particular objective?

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COAL MINING PROGRESS Keynote of Rocky Mountain Institute Meeting

(Continued from page 350)

asserted, "management is surrendered to the men." If operators continue with contracting, the same bad conditions will always prevail. J. E. Edgeworth, superintendent, Lion Coal Co., Rock Springs, Wyo., expressed the hope that operators would not continue to agree to contract work in mechanical loading, as wage precedents, once established, are hard to change.

Mr. Brown said that his company had used machines for twelve years, and that it had found that in the last three years the tonnage per man was almost uniform. The company is now considering a bonus plan to stimulate production and get the efficiency out of the machines that it should get. Following the discussion, the motion picture, "Wildwood—A 100 Per Cent Mechanized Mine," was presented by the Westinghouse Electric & Mfg. Co.

Preparation and vocational training for coal miners occupied the attention of delegates at the final session, in the afternoon of May 28, presided over by President Snodgrass. "It would be easier to discuss the subject of coal preparation," said J. B. Morrow, preparation manager, Pittsburgh Coal Co., Pittsburgh, Pa., whose paper was read by J. R. Campbell, bituminous representative, Koppers-Rheolaveur Co., Pittsburgh, Pa., "if we had definite standards upon which to work. Unfortunately, in the large majority of instances, this is not the case, and at the present time the most common yardstick is either the visual inspection at the loading point or the amount of reaction from the customer at the other end."

Mechanical cleaning, Mr. Morrow concluded, remove more refuse than hand-picking and leaves a lower ash coal. In addition, "apart from the cleaner coal produced, a mechanically prepared coal has a big advantage over the hand-picked, on account of uniformity. In any consideration, this matter of uniformity probably is the most important single factor as far as the customer is concerned. One of the most interesting developments of the last few years has been the increased attention paid to mixtures of sizes and the proper blend of the various sizes which will yield the maximum steam-producing results at the consumer's plant." Mr. Morrow's paper, including a discussion of the factors influencing the selection of a cleaning plant, is covered in greater detail on pages 362-364 of this issue.

A general discussion of the question of vocational education for coal miners concluded the last technical sessions of the meeting. Short talks were given by F. M. Treat, D. W. Rockey, and C. G. Sargeant, directors of vocational education for Wyoming, New Mexico, and Colorado, respectively; William Moorhead, Phelps Dodge Corporation, Stag Canon Branch, Dawson, N. M., and others.

BEEHIVE OVENS

+ Take Up the Slack

In Gauley Mountain Coal Business

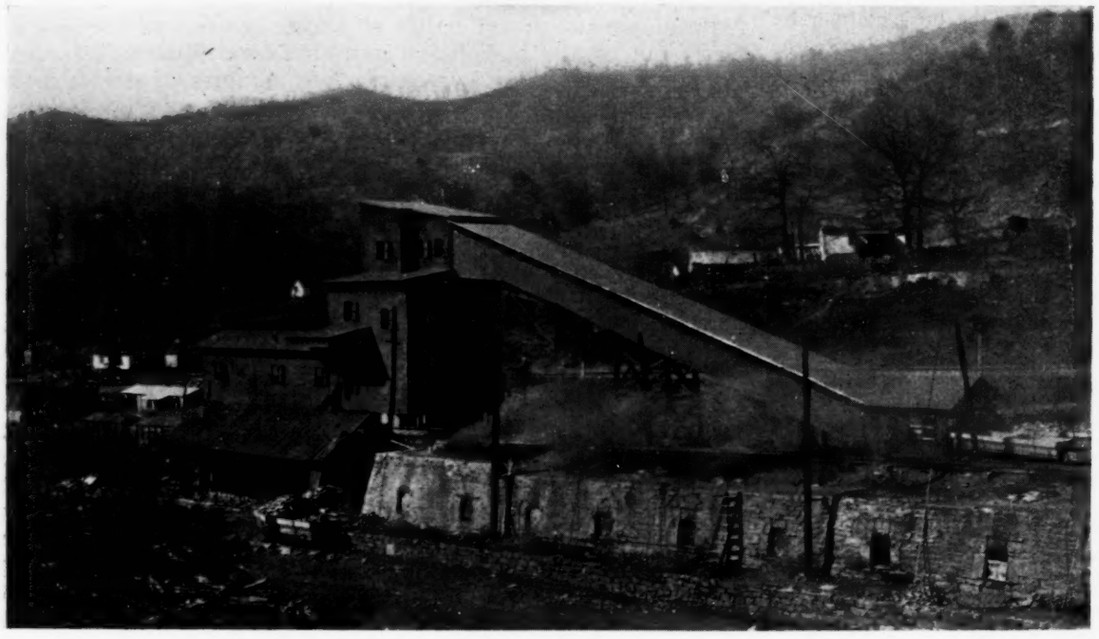
THAT the final abandonment of beehive coke ovens is not imminent is indicated by a recent expenditure of approximately $30,000 by the Gauley Mountain Coal Co. in building a coke screening and loading plant at Ansted, Fayette County, W. Va., to handle the product of its 148 ovens that have been in continuous operation at the mine for many years. The primary object of this plant is to screen the coke to produce a superior foundry coke and market the smaller sizes as domestic fuel. Although a crusher is included in the new plant, the principal source of domestic shipments is the minus 2¼-in. product from the main screen.

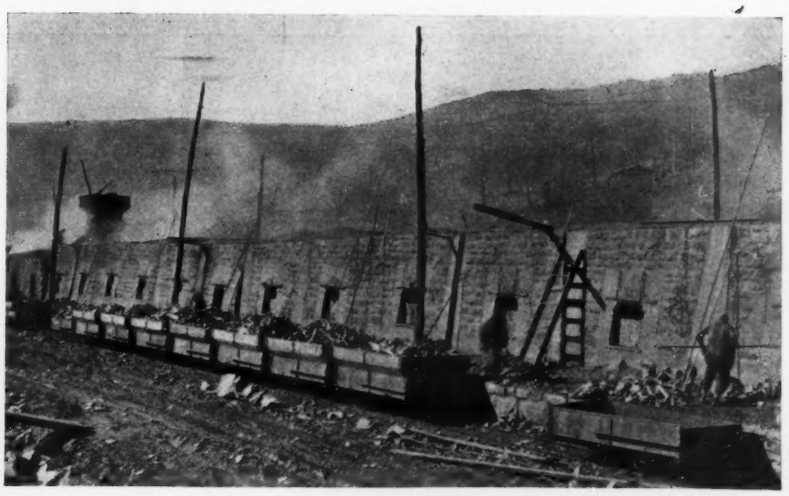
As expressed by R. H. Morris, general manager, the beehive ovens serve to take up the slack—both literally and figuratively—in the coal business of the Gauley Mountain company. Practically all of the slack size goes to the ovens. Although there is no mechanical cleaning equipment at the mine, face and tipple preparation of the output controlled to the extent that there is a steady market demand for all but the slack. In 1929 the average of the cargo analyses for 111,600 tons taken by one consumer showed 4.52 per cent ash and 0.83 per cent sulphur.

Prior to the new installation, the coke was forked and loaded by hand into railroad cars spotted at the oven face. In the change, the old standard-gage track was replaced by one of narrow gage set much closer to the face to provide for convenient loading into 2-ton cars. These cars became available from the mine by reason of the introduction of conveyor mining and the attendant concentration. Wooden sideboards were added to increase the volumetric capacity.

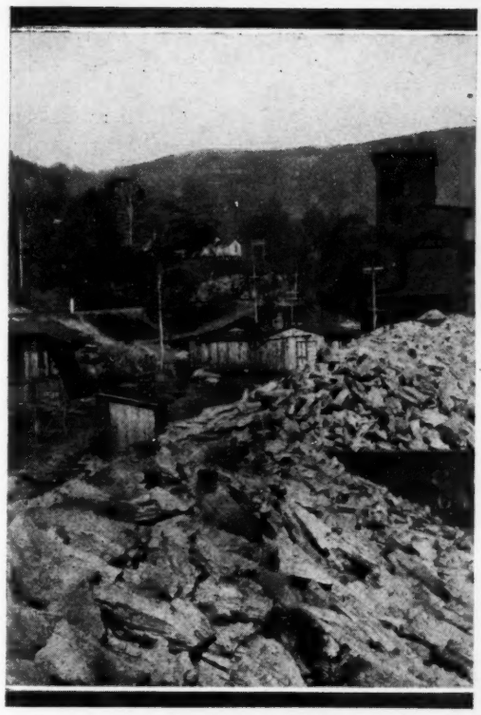
The cars are pulled up an incline, one at a time, and dumped automatically at the top of the structure. In order to minimize breakage, the dump, which turns the car over endwise to a position 120 deg. from normal, is fitted with a solid end that extends several feet higher than the top of the car. First the coke rolls

This New Plant for Screening Coke Is an Indication That Beehive Ovens Will Be Operated for Many Years

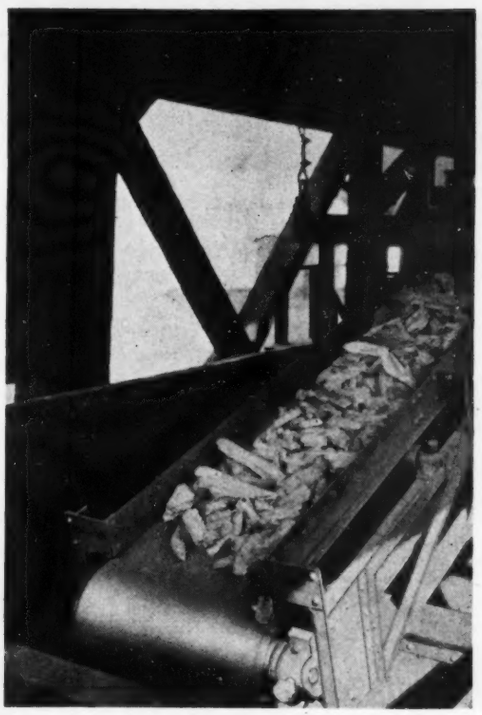




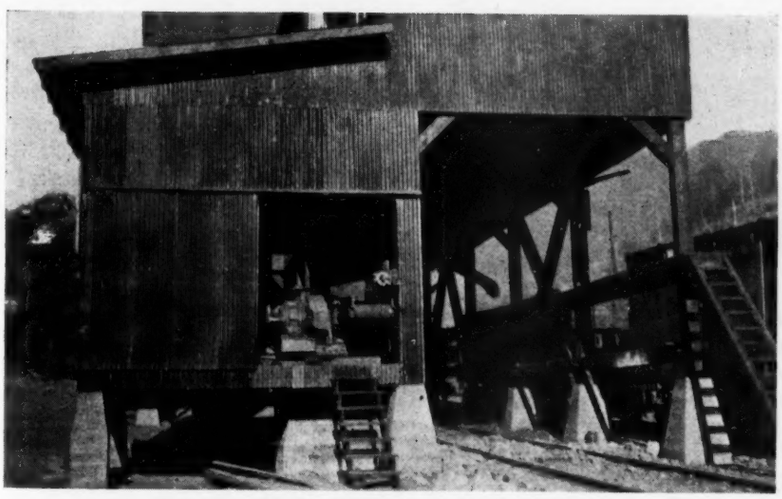
Ovens Rebuilt With Concrete Piers Anchoring the Face Wall; the Track Is Set Close, Allowing Direct Loading Into the Reconstructed Mine Cars.



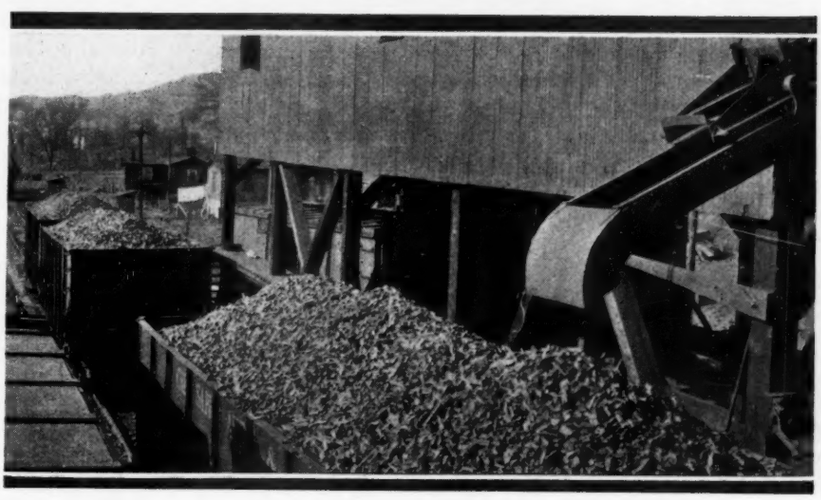
Shipments of Foundry Coke, the Primary Product, Leaving the Plant



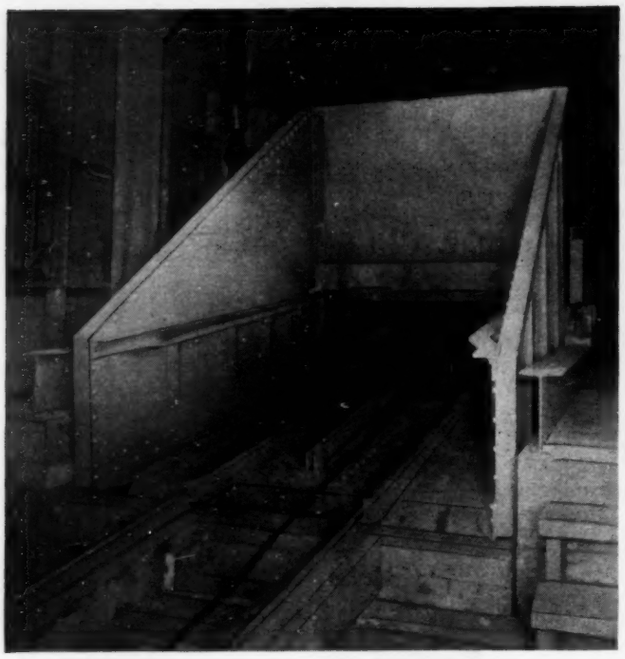
A Belt Boom for Loading Foundry Coke Into Hopper Cars



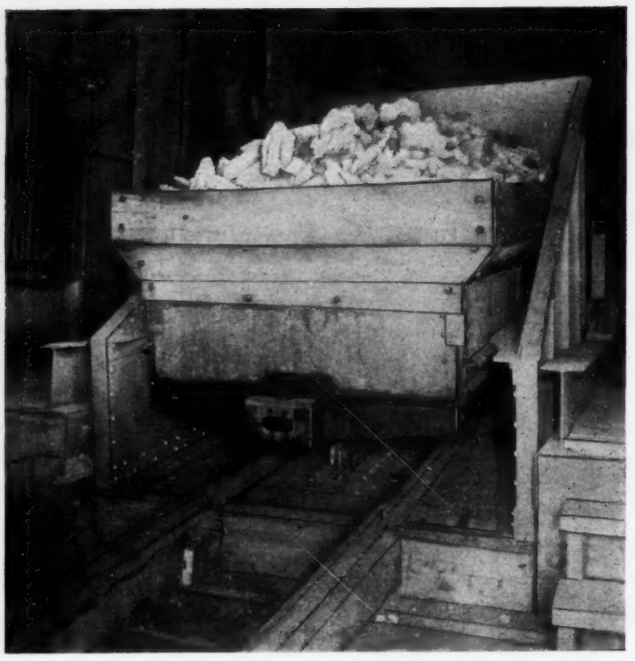
The Box-Car Loader Is Seen Through the Doorway



Loading Domestic Sizes



Coke Dump in the Top of the Plant; the Hoist Rope Head Sheave Is in the Dump



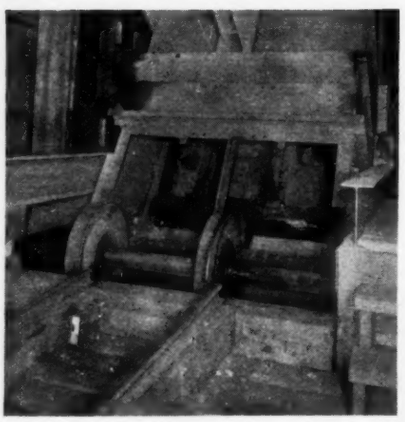
Cars Are Pulled Into the Dump by the Hoisting Rope

into this space, and later slides down into the chute. The arrangement of clearance between the sloping bottom of the chute and the top edge of the dump, as the latter swings downward, aids in this two-stage dumping. Not until the dump reaches a point near the lower limit of travel is there sufficient clearance for the coke to slide into the chute. No one is stationed at the dump, and the hoist operative is located at the foot of the incline, where he can take care of other jobs.

The plant equipment consists of a main screen, egg and nut screens, crusher, a picking table and loading boom of the belt conveyor type, a box car loader, and an elevator. The normal capacity is 30 tons per hour. Two loading tracks are provided.

All screens, including the main, are of the motor-driven wire-mesh vibrating type set on a pitch favoring the flow. Four inches is the largest mesh used on the main screen. Smaller sizes, down to $2\frac{1}{4}$-in., are substituted when necessary to satisfy demands for other sizes.

Under normal operation all of the oven-run coke goes to the main screen. That which rides over is hand-picked to eliminate dark butts, and then is loaded over a belt boom or over an Ottumwa box car loader, as the case may be. Most of this coke, which is the foundry product, is now shipped in hopper cars. Each year the box-car shipments decrease.



Slacking-Off the Hoist Rope Allows the Dump to Tip Back to Normal

That which passes over the main screen and over a $\frac{5}{8}$-in. screen goes to the domestic market. The under-$\frac{5}{8}$-in. is wasted. Assuming that a $2\frac{1}{2}$-in. mesh is being used on the main screen, the domestic sizes are a $2\frac{1}{2}$x$1\frac{1}{2}$ egg and a $1\frac{1}{2}$x$\frac{5}{8}$ nut.

When the market demands less foundry coke and more domestic fuel, the oven-run is diverted to a crusher and the product is then separated into egg and nut. A pea size can be separated if desirable.

Special construction is used to combat the severe abrasive action of the coke. The dump chute leading to the main conveyor is lined with flint tile set in concrete. Chilled cast-iron plates line the main conveyor, which is of the chain-flight type.

In addition to the sizing within uniform limits, the loading plant has been the means of reducing the oven crew by seven to ten men. Better product was the principal reason for building the new plant, but the labor saving alone will pay the interest on the investment.

Other improvements pertaining to the production of beehive coke have been made at Ansted during the past year. Power consumption and maintenance cost chargeable to coal crushing has been cut in half by the installation of a new crusher of the hammer type to replace the original disintegrator. Also "Kittell" concrete piers and higher face walls have been installed at a number of ovens that needed repair. These piers taper to a wider dimension at the front, so as to key the stone wall in place and prevent bulging. J. A. Kittell, now the coke superintendent at Ansted, perfected this pier some years ago while employed in the Pennsylvania coke region.

That the Gauley Mountain Coal Co. finds beehive coking of the screenings a profitable enterprise is further indicated by an announced intention of shipping the screenings from its other mines to the Ansted plant for coking. Since the railroad haul is 15 miles, this plan is dependent upon a favorable freight rate.

Mr. Morris states that the company is finding an increasing demand for the domestic coke. This changing circumstance fits nicely in the scheme of the new plant, inasmuch as the domestic sizes may be considered as a byproduct in the manufacture of foundry coke, the main product.

BACK TO THE WEDGE

+ But This One Is Power-Driven

By F. W. WHITESIDE

Chief Engineer
Victor American Fuel Co.
Denver, Colo.

EXPERIMENTS are being made by the Victor American Fuel Co. on the use of wedges for breaking down coal. This means of dislodging the mineral is by no means a novelty except as to the specific device used for that purpose, which in this case is power-driven.

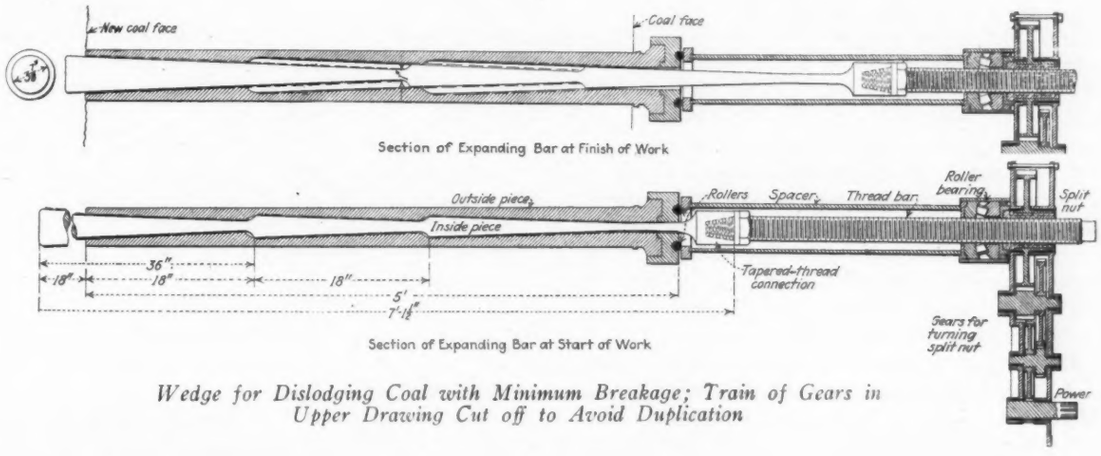
The wedge with which the Victor American Fuel Co. has been working consists of a middle member 10 ft. 6½ in. long and two outside members exactly alike, each 5 ft. long, together forming an expanding barrel. There also is a train of transmission and reduction gears, an electric motor, and a cylindrical spacer of 4¼ in. inside and 5 in. outside diameter by 20 in. long with a roller bearing of special design at each end.

The shotholes in which the machine works are drilled with a special cutting bit and a shank of suitable design driven through two sets of miter-aligning gears by the same motor which operates the expanding wedge or bar. The middle member of the expanding bar consists of three wedges in tandem, terminating in a screw 2½ in. in diameter and 34½ in. long and having four threads to the inch.

The pitch of each side of the three wedges is 0.4792 in. per foot, so that the wedge as a whole has twice that pitch, or per foot 0.9584 in. The outer members which form the expanding barrel also have a pitch of 0.4792 in. When the three parts are placed together in proper relation to one another and the wedge is in its most contracted condition and ready for insertion in the shothole, it is circular in section, 3⅞ in. in diameter, and the sliding surfaces of all its three members are in close contact. Its maximum expansion is $1\frac{7}{16}$ in., or 37.1 per cent.

To expand the device the top and bottom wedge members are anchored in the shothole and the middle member is pulled outward or toward the operator. The middle member of the first machine was equipped with an eye or loop instead of the 2½-in. screw now used. Through this eye a heavy steel bar was inserted which paralleled the face. Two ordinary screw jacks were then placed between the bar and the heavy steel plate, which latter rested against the stationary members of the expander and the coal face. The two jackscrews were expanded simultaneously and at equal speeds. This brought down the coal satisfactorily, but in operation it was much too slow, so instead of the eye, the screw of one of the jacks was substituted, it being welded to the middle bar near the point where it protrudes from the coal face when the expander is in place in the shothole and "ready to go." Working on the screw was a sort of nut turned or actuated by a long hand-operated crank. When

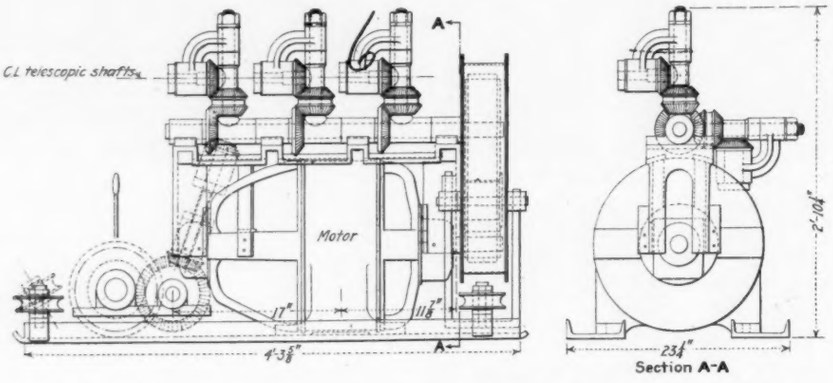
Abstract of paper presented at the Rocky Mountain Coal Mining Institute, Denver, Colo., May 27.



Wedge for Dislodging Coal with Minimum Breakage; Train of Gears in Upper Drawing Cut off to Avoid Duplication

the nut was revolved on the screw the effect was the same as when one tightens the nut on the bolt of an expansion anchor. This change was a great improvement, but the expanding action was still too slow for practical purposes.

The next advance was the use of a train of gears driven by an electric motor. The total speed reduction accomplished by this mechanism was 120.33:1 with a corresponding increase of power, friction being neglected. Hence, with a motor speed of 600 r.p.m. the nut which engaged the middle member of the expanding bar made a revolution 4.98 times every minute.



Machine for Drilling Three Holes at One Time and for Pulling Expanding Bars in These Holes so as to Bring Down the Coal

With 7½ hp. delivered to the gear-train by the electric motor, the nut or gear should exert a pull of 2,385,540 lb. on the 2½-in. screw to which the middle member of the expander is attached, and the total expanding force of the wedge, therefore, would be 29,869,000 lb. distributed throughout the 5 ft. of drillhole. In this calculation no account has been taken of friction. However, with polished rubbing surfaces in the wedge and with all the moving parts which are in contact with one another well lubricated, the friction losses may be assumed at 50 per cent, leaving an expanding force in the wedge of 14,934,500 lb.

This, of course, is a theoretical value, as neither the 2½-in. thread bar nor the expanding bar itself is of sufficient size or strength to withstand forces of this magnitude. Many trials have demonstrated that 1⅞ hp. is sufficient to expand the bar and bring down the coal. This gives a figure of 3,733,625 lb., or 1,866.8 tons, as the approximate force exerted. The drillholes are placed in about the same positions in the face as when an explosive is used and the shots are "fired" in the same order.

To expedite the work of drilling the shotholes and expanding the bars several different types of drives have been devised. The first of these is mounted on a mining machine and is driven by one of its shafts. It consists of a main bevel gear which drives three sets of miter gears, each set consisting of three gears and so arranged as to have freedom of movement in any direction. Each set of miter gear drives, through a telescopic shaft, a second set of three miter gears, each set of which is mounted on a post and operates first the drill and finally the expanding bar. Thus three drillholes can be driven or three bars expanded simultaneously.

Reference has been made already in this paper to the use of a 7½-hp. motor. This unit is mounted on skids to expedite movement from one place to another. A horizontal shaft is mounted on top of it and is driven by the motor. This in turn drives six sets of miter gears of three gears each, three sets being mounted on the horizontal shaft and each through a telescopic shaft driving the remaining three sets, each of which is mounted on a separate post placed in proper position in front of the hole to be drilled or expanded. This unit is equipped with a rope drum, with which it may easily be moved from one working place to another under its own power.

These devices result in a speed of 250 r.p.m. for the drill and 6 r.p.m. for the gear which actuates the expanding bar. The actual drilling time required to drill a shothole 8 ft. deep is 1¾ minutes, and to expand the breaker bar to its fullest extent, 12 minutes.

When the set-up driven by the mining machine is used, the place is first undercut with the mining machine, the shotholes are then drilled and the expanding bars placed in the holes and expanded, requiring about 15 minutes for drilling and expanding, after which the machine is moved to the next working place. When the motor unit is used it follows the mining machine, bringing down the coal after each place is undercut.

In the Chandler mine, tests have been made which show an increase of 20 per cent of lump and a decrease of 9.6 per cent of slack coal over that obtained by the use of explosives. In the thicker seams of Routt County it is expected that the percentage of lump coal will be even more greatly increased.

Many tests have been made with the expanding bar in places which have not been undercut. These, of course, have required the drilling and expanding of a greater number of holes; nevertheless the lump coal has been increased 6 per cent.

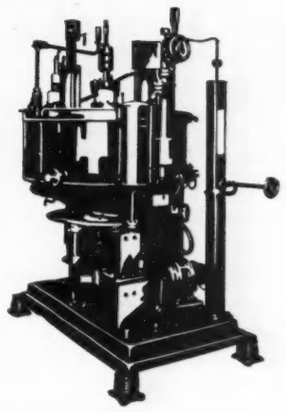
Numerous trials have shown that better results are obtained with the expanding bar by operating it with the comparatively slow speed of 6 r.p.m. on the driving gear, for, if given a little more time, the coal that is being brought down does some of the work itself. Naturally, wide places are more easily "shot" than narrow ones. It has also been demonstrated that a hard and possibly brittle coal is more easily brought down than a tough, tenacious one.

As severe strains are set up in the working parts of this machine, in developing such enormous forces, all gears and some of the shafts are of heat-treated steel, thus insuring strength and reducing weight. The expander at different times has been made of mild nickel and molychrome, and the thread bar which is attached to the middle member, of Machinery B steel. The conclusion has been reached that the steel of which the bar is constructed must not only have great tensile and compressive strength but possess a high degree of toughness also.

The wedge provides a safe method of dislodging the coal from the working face and one which can be utilized at all times of the day with perfect safety to all men in the mine, even to those working within 2 ft. of the coal being dislodged. It promises a large increase in the percentage of lump at a time when slack coal is a drug on the market. Its consumption of power also is so small as to be nearly negligible.

MERCURY-ARC RECTIFIER

+ Makes Bow in Anthracite Field



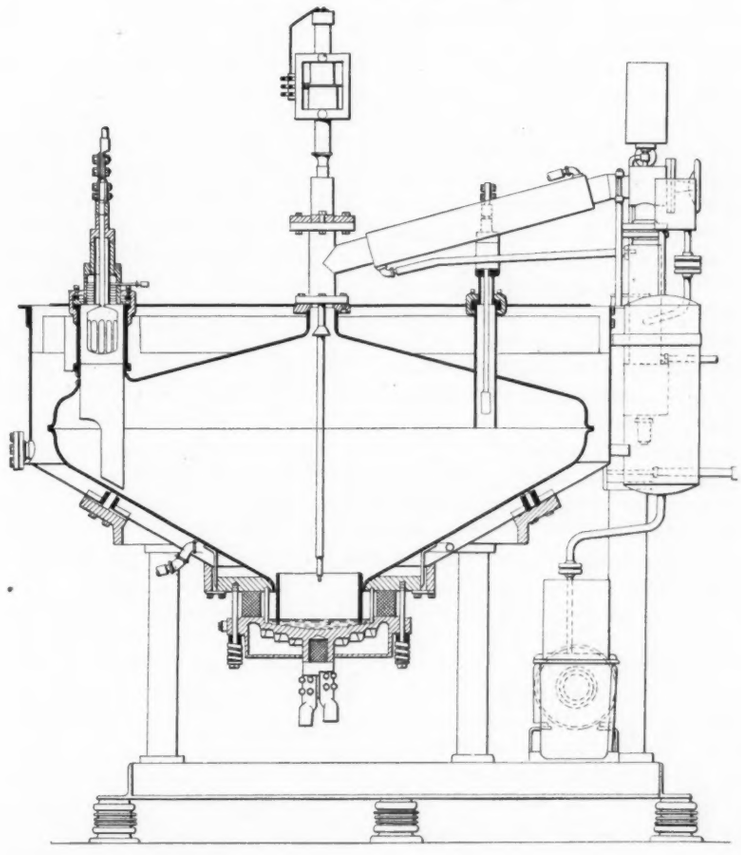
By C. R. SEEM

Electrical Engineer, Glen Alden Coal Co., Scranton, Pa.

MERCURY-ARC rectifiers have been adopted by many high-voltage railway systems, but the application of this equipment to such low voltages as are used in coal mine service is somewhat unusual. A 275-kw. 275-volt machine is now being tried out at the Storrs No. 3 colliery of the Glen Alden Coal Co. During the day, the load, which consists of mine locomotives, cutting machines, shaking conveyors and pumps, is carried by both a 500-kw. 275-volt rotary converter and the rectifier running in parallel; at night and on Sundays, however, the mercury-arc rectifier takes the entire load.

It has long been known that when two electrodes are properly arranged with the cathode brought to a state of electronic emission and the anode is maintained at a temperature below that at which the liberation of electrons is possible, a valve action occurs which allows passage of current in one direction only. This is the underlying principle of the rectifier. Distilled commercial mercury is used, because it is easily condensed and thus returned to the cathode.

Fig. 1—Cross-Section of Rectifier



The transformer used with the machine installed at Storrs, and built by the General Electric Co., is designed with a six-phase secondary. The rectifier itself consists of an inner, or vacuum, tank with main anodes, excitation anodes, and ignition anodes at the top. At the bottom of the tank is the opening for the cathode. The outer tank is simply a water jacket. Both anodes and cathodes are insulated from the tank. The cathode consists of a pool of distilled commercial mercury held in a steel container which is water-jacketed to hold down its temperature. A cross-section of the rectifier is shown in Fig. 1. The wiring diagram appears in Fig. 2.

An almost perfect vacuum is needed in the tank. The rectifier is operated at a pressure of 0.0001 to 0.0005 mm. of mercury. This result is obtained by means of a mercury-condensation pump, a vacuum valve, a receiver tank, and a motor-driven rotary vacuum pump. The mercury pump is the first stage and removes the gases from the vacuum chamber of the rectifier and exhausts them into the receiver tank. Then the rotary pump, acting as a second stage, takes the gases from the tank to the atmosphere. The mercury-condensation pump has no moving parts; it is a heat-operated device working continuously. The rotary pump is operated only an hour or two per day. The vacuum valve between the exhaust system and the rectifier makes it possible to inspect the exhaust system without shutting down the rectifier.

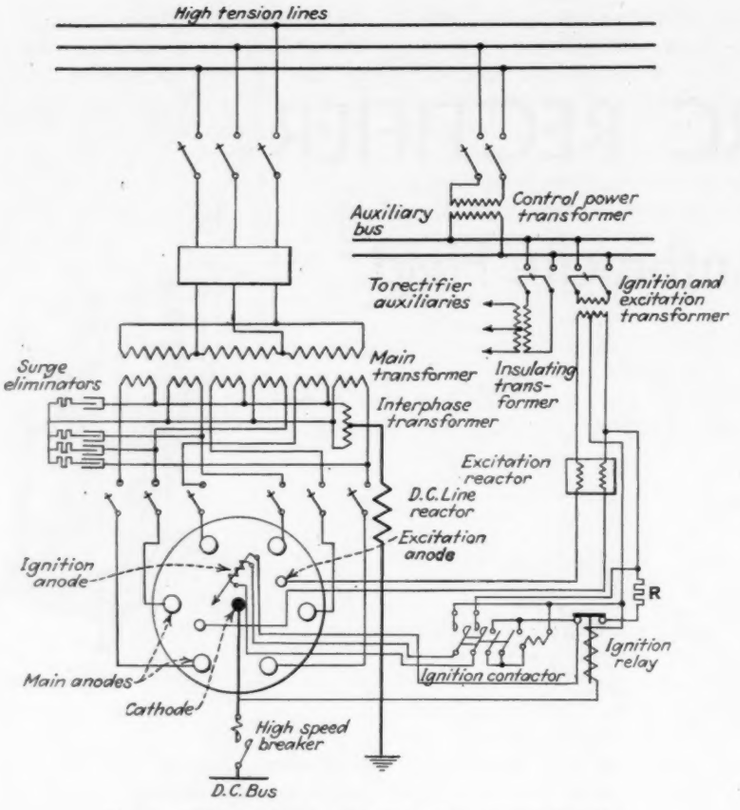


Fig. 2—Wiring Diagram for Transformer and Rectifier

Before the rectifier can be loaded, it is necessary to bring the cathode to a state of electronic emission. This is done by closing the switch to the starting motor-generator set. The ignition contactor allows current to flow to the solenoid of the ignition anode, which in turn forces the movable plunger located inside the vacuum chamber into the mercury pool of the cathode. When the plunger strikes the mercury, current flows through the plunger, the mercury current limiting resistance and the ignition relay. The relay then breaks the current flowing to the solenoid, which, when de-energized, allows the plunger to be drawn from the mercury pool by the return spring. As the plunger leaves the mercury, an arc is formed and cathode emits electrons. The mercury vapor in the vacuum tank is then ionized and ready for the power arc to pick up according to load conditions.

The rectifier unit can be started and shut down by remote-control or other automatic-control devices. When the rectifier is started, the automatic-control equipment checks tank temperature, internal pressure, and cooling water for the condensation pump, protects against low or single-phase a.c. voltage, provides temperature control for protecting load-limiting resistors and protection from repeated a.c. overcurrent. When these things are correct, the rectifier is started by the ignition equipment. The oil circuit-breaker closes, followed by the d.c. line-circuit breaker. The entire line-starting sequence can be performed in approximately 10 seconds.

The operating engineer's goal in designing his d.c. layout is: (1) reliability of service, (2) real automatic operation, (3) machines which can be installed at or near load centers, (4) high efficiency during both load and off-peak hours, and, (5) ease and quickness in repair in case of breakdown. How does the mercury-arc rectifier meet these specifications?

1. The mercury-arc rectifier has no main rotating or moving parts. The only moving parts are those of the vacuum rotary pump, which can be duplicated at small expense if so desired. The latter has neither commutator, collector rings, brushes nor bearings. It does not get out of balance and is not subject to failure from lack of proper care of oil levels and windings; in this respect it has the advantage over the rotating machine. It is subject, however, to the disadvantage that it must be water-cooled and protected from freezing and from water failure.

2. The rectifier lends itself ideally to automatic operation, for it needs no protection from overspeed. It cannot run away, get out of balance, or have hot bearings. Fewer automatic control devices are needed than with the rotary converter.

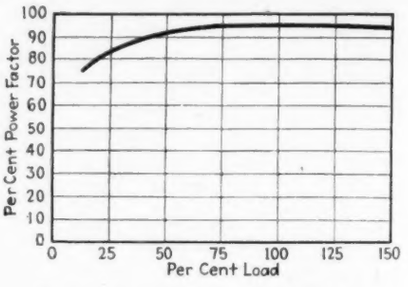


Fig. 4—Power-Factor of Rectifier at Various Loads

3. The only advantage of the rectifier with respect to installation near actual load centers is its adaptability to automatic operation. Like the rotary converter, it requires transformers. It must be located near a source of good water unless a self-contained cooling system is used. It will occupy as much, or even a little more, space than a rotary converter.

4. Where machines are operated

Fig. 3—Comparative Efficiencies of Rectifier and Converter

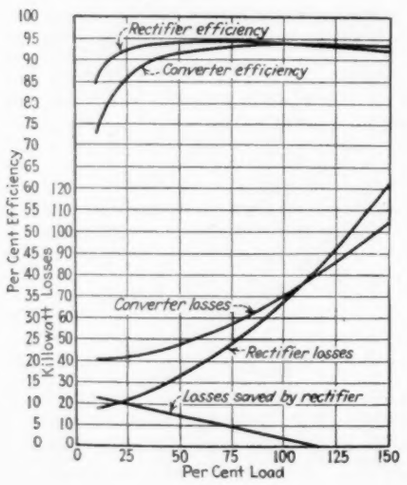
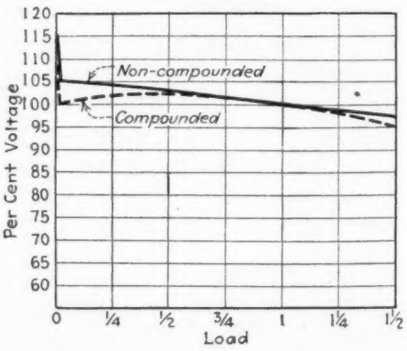


Fig. 5—Voltage Characteristics of Rectifiers



on heavy loads during the day and on a 25- to 50-per cent load nights, Sundays, and holidays, the mercury-arc rectifier offers much to think about. This equipment is capable of high momentary overloads such as are encountered in mine service and it is not injured by short-circuits on the d.c. system. Comparative efficiencies of the mercury-arc rectifier and rotary converters are charted in Fig. 3. As will be seen from Fig. 4, however, the rotary has the better of the power-factor argument, for it will run at unity power factor at loads above 50 per cent and give leading power factor on light loads. Fig. 5, showing the voltage characteristics of the mercury-arc machine, explains why the rectifier works so nicely with the rotaries with which it may run in parallel.

5. The experience at Storrs No. 3 so far has given no conclusive data on ease of repair. The only trouble experienced has been a slight leakage on the vacuum gage, causing loss of vacuum on light loads. No shutdown occurred, and the trouble was easily overcome when located.

TIMBER TREATMENT Opens Way to Substantial Savings In Mine Operating Costs

(Continued from page 356)

vided which, when applied to a section cut from a piece of treated wood, will turn yellow wherever it comes in contact with the solution and therefore will readily show the depth of penetration.

For the reasons just given, it is also unwise to have too wide a mixture of different kinds of timber in one retort. In other words, green timber should not be mixed with seasoned timber and inch boards should not be mixed with round posts, because the seasoned timber in the first case and the inch boards in the second case would absorb more than the amount necessary; therefore the other timber would get less than the necessary amount because there is no way to find the amount of absorption for each piece of wood while it is in the retort.

During this time, only the total absorption for all the wood can be read from the gages of the measuring tank. It is possible, however, and is good practice, to weigh a piece of wood of each size occasionally before and after treating. In this way, the quantity of solution can be accurately determined; then if that piece of wood is cut in two and the red chemical applied, the depth of penetration can be found. These two determinations will give very accurately the results of the treating.

Practically no waste of solution results from opening the retort and bringing out the timber. The high temperature used makes the timber dry very rapidly. In treating lumber, such as inch planking, with a very large surface area in proportion to the cubic content, it may be necessary to draw a short vacuum before the retort is opened. This will thoroughly dry the surface of the lumber. The water in the solution in the wood evaporates, leaving the salt, which sets in a manner similar to the action of cement in mortar or concrete. Once the salt has set, it is insoluble. This takes three or four weeks. Therefore, ties which are for use in wet places should be allowed to dry before using, while those for use in dry places can be immediately put in the track.

All wood is unloaded from trucks or railroad cars, stacked, loaded on the retort cars and treated by one plant operator and helper. Occasionally it is necessary to call in an extra helper. During the first five months' operation ending Dec. 31, 1929, nearly four hundred thousand board feet were treated. A condensed classification and cost summary is given at the end of the following column.

We are told that in German mines, where fungous growth is particularly active, untreated ties last about six months. With this process of treating, all other conditions being the same, 24 years of life has been obtained from ties of the same kind of wood. In calculating the saving which it is hoped to effect, calculations are based on ten years life. The average cost of a 6x6-in.x6½-ft. tie is 50c. The estimated cost of handling and placing in track which has formerly been laid—including taking out the old ties, placing the new ties, and surfacing the road—is about the same, making $1 in all. In the case of untreated timber, it would be necessary to have about 2½ replacements in ten years—based on our past experience. The cost of the ten years, therefore, is $2.50, or 25c. per tie a year.

When treated ties are used, 20c. for treating is added to the cost of purchasing and placing, which makes the total cost $1.20. Assuming ten years life, the cost per tie would be 12c. per year—less than one-half that of untreated timber. It is no longer necessary to use white oak ties, as many other woods costing as much as 20 per cent less than white oak will give equally good results. A comparison of mine-post replacements will not show a saving quite as large as this, but when flooring, porches, stairs, etc., for houses are brought into the calculations, the saving effected will be nearly equal.

While the above assumption cannot be proved for eight or ten years, in view of experience and results which have been obtained in this process of treating, we feel that these figures are very conservative and will show readily the great economical saving possible from a practical application of wood preservation in the coal-mining industry.

Statement of Operations for First Five Months

CLASSIFICATION OF TIMBER TREATED

	Number	Cu.Ft.
6x6 in. green mine ties	1,408	2,722
6x6 in. seasoned mine ties	10,894	18,879
4x6 in. green mine ties	4,237	4,237
Round posts	1,050	3,975
	17,589	29,813
Miscellaneous (consisting of sawed lumber ranging in size from 1 in. boards to 12x12 in. timbers)		1,849
		31,762
Ft. B.M.		381,144
COST		
Material and supplies	$47.57	
Labor	$1,806.54	$1,854.11
Cost per foot B.M., cents		0.480
Triolith (Wolman Salt) 7,594 lb.		1,990.00
Cost per foot B.M., cents		0.530
Total cost		$3,844.11
Total cost per foot B.M., cents		1.01

Depreciation is not shown here for the reason that since the annual quantity of wood to be treated is not yet known, it cannot be reduced to cost per foot of B. M.

FITTING PREPARATION

+ To Meet Market Demands

By J. B. MORROW

Preparation Engineer
Pittsburgh Coal Co.
Pittsburgh, Pa.

IT WOULD BE MUCH EASIER to discuss coal preparation if we had definite standards upon which to work. Unfortunately, in most instances this is not the case; at the present time the most common yardstick is either the visual inspection at the loading point or the reaction from the customer at the other end.

Perhaps quite a number of us have had the experience of receiving a complaint from a customer stating that he had found 300 or 400 lb. of rock and bone in what was supposed to be a well-prepared car of egg coal and that he wants to know, "Why?" Of course, it would not sound well to answer the customer by saying that if he himself had done a really good job of picking out the impurities in this particular car, we feel quite satisfied that he would have found *more* than 300 or 400 lb. of material that could be classified as extraneous impurity.

However, we have been so insistent in our advertising that we are shipping only 100 per cent clean coal that we are unable to raise the question of the tolerance involved, although, at the same time, we realize that there is a certain limit to the performance of either hand pickers or mechanical preparation. This fact is well recognized in the anthracite field, but lacks attention in the bituminous-coal industry.

Visual inspection on prepared sizes of coal in, say, 2½x4-in. or 1x2½-in. sizes is not sufficiently dependable or accurate enough for control purposes. The only real determinant for extraneous matter is the float-and-sink test in heavy-density solutions, where, on the average, approximately 1.60 specific gravity can safely be used as a dividing line between coal and extraneous matter. It is true that there may be some laminated material less than 1.60 specific gravity which may appear objectionable from a visual inspection, but I do not think that I have ever seen any sink material in a 1.60 solution which could not definitely be classified as extraneous matter that should be removed.

Actual large-scale tests on hand-picked coal, 2½x4-in., have shown that the percentage of 1.60 sink, or the extraneous matter, will vary from

J. B. MORROW

0.7 to 4.5 per cent, with an average of 2.2 per cent, and this is coal which was carefully picked and would undoubtedly be advertised as "100-per cent clean coal." Yet, in an average 50-ton car, it would mean that 2,200 lb. of extraneous matter could be found in place of the 300 or 400 lb. of which the customer complained. I would like to impress again that these are not theoretical figures but actual results obtained from a reasonably clean coal seam.

I have similar figures on a Western high-quality egg coal which show 4 per cent of extraneous matter left in the coal after picking, so it is really not a cause of much wonderment that an occasional complaint comes in on the quantity of free impurity left in the coal.

The same kind of testing on 1x2½-in. coal will show a variation of from 1.2 to 7.1 per cent of extraneous matter, with an average of 3.7 per cent on the coal as shipped, after picking. It would seem highly probable that one would hear from a customer when a car contained 7.1 per cent of extraneous matter after having been picked. I also have figures on a Western coal, of this same size, which show an average of 5 per cent material heavier than 1.60 gravity, left in the coal. Again please note this is after picking.

In other words, it would seem that often our advertising claims are somewhat at variance with the facts concerning the average run of hand-picked coal from a reasonably clean seam. The extraneous matter left in the coal, after picking, will run from 45 to 55 per cent ash, and so can hardly be claimed to be combustible matter.

Under favorable working conditions, with an average quantity of impurity in the seam, one hand picker can remove a maximum of about 2 tons per hour of pickings from plus 4-in. coal. Assuming one picker to each 25 tons of plus 4-in. coal per hour and taking a general average of these pickings at 30 per cent ash, it will mean that there has been an actual ash reduction of 2 per cent due to hand picking. On plus 2½-in. coal the picker's capacity probably will average approximately 1½ tons per hour and on 2½x4-in. coal this will be reduced to ¾ or perhaps 1 ton per man-hour. In other words, it is necessary to have twice as many pickers per ton of coal handled on 2½x4-in. tables as compared to the number

From a paper presented before the Rocky Mountain Coal Mining Institute at Denver, Colo., May 28.

needed when picking plus 4-in., if an equivalent ash reduction is desired.

To set up any definite standards, the picker must be considered as a machine with a certain picking capacity, and in order to maintain a constant quality in the shipping product, it will be necessary to have as many pickers as would be called for by the average maximum percentage of extraneous matter in the coal coming from the mine. Of course, in practice this is not done. What actually happens is that, when the coal is too dirty, the picking tables are shut down long enough to clear them of the excessive quantity of impurity.

To turn to mechanical preparation, Table I gives average percentages of sink material likely to be found in coal prepared by modern methods.

Table I—Averages of Sink Material for Different Sizes of Coal

(1.60 Specific Gravity)

Sizes of Coal, In.	Sink Percentage
2½x4	0.5
1 x2½	1.0
½x1	2.0
0 x ½	2.0

There is a further significant difference between the hand and mechanical separation, due to the nature of the extraneous matter left in the coal. With hand picking, the extraneous matter in the 1x4-in. sizes will average from 45 to 50 per cent ash, and with mechanical preparation, the extraneous matter will average from 35 to 40 per cent ash. In other words, there is less rock from mechanical preparation.

The customary practice in coal-mining accounting is to distribute the hand-picking cost over the entire tonnage instead of over the tonnage of coal actually picked. This tends to cloud the actual preparation costs. In many cases it will be found that, if the hand-picking cost is charged only to the prepared sizes and if the refuse from the hand pickings also is charged against those same sizes, where it certainly belongs, then hand picking will be more expensive than mechanical preparation, except possibly at the small-tonnage mine.

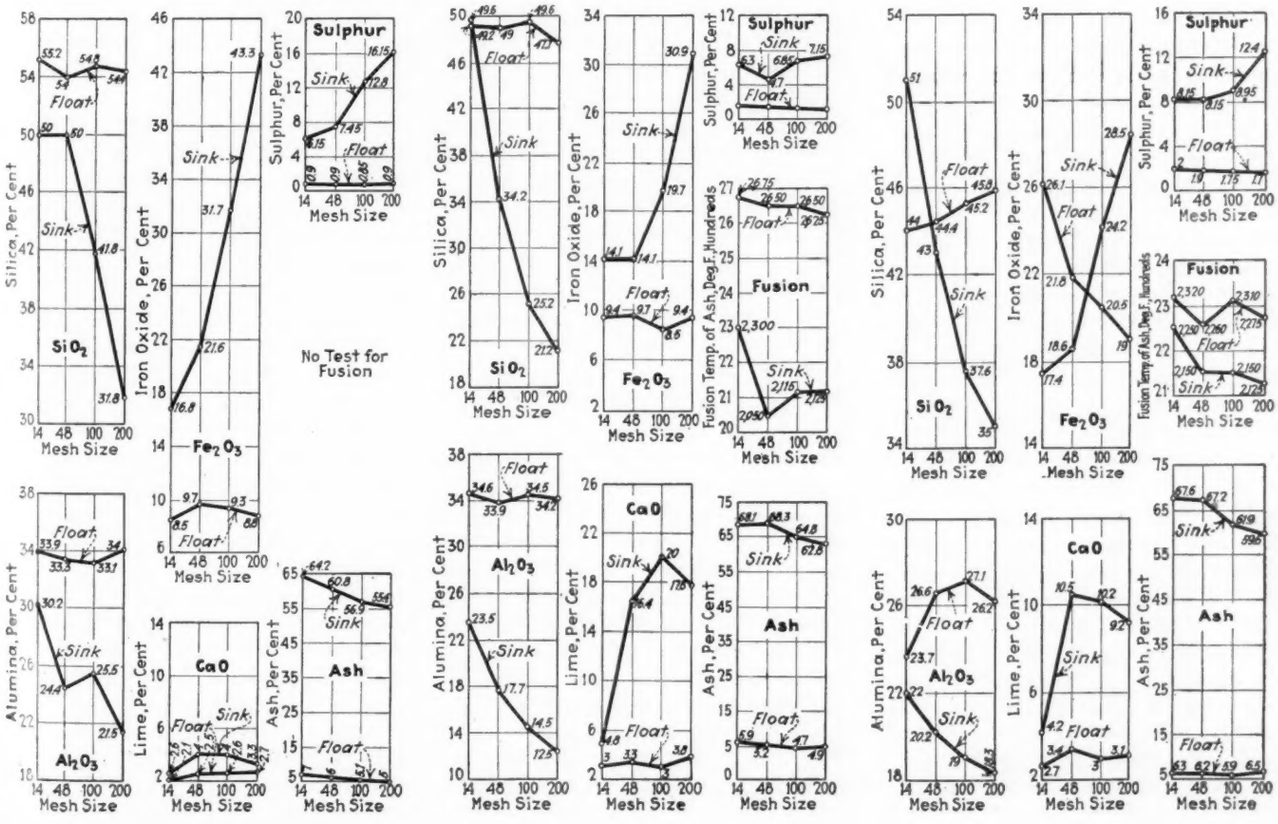
The refuse loss from hand picking, which generally will contain about 60 per cent coal, is a real and not a book loss. In many cases this item will amount to more than the actual picking labor. It is obvious in the case of dirty coal with a large tonnage of pickings, that a considerable difference in cost will be found when hand-picked refuse with 60 per cent of coal is compared with mechanically cleaned refuse with 5 per cent of coal. In making a comparison of cost between mechanical preparation and hand picking, it is necessary also to consider that the cost of cleaning minus ⅜-in. coal probably will average about twice that of cleaning 1x4-in. coal exclusive of the refuse loss.

Apart from the cleaner coal produced, a mechanically prepared product has a big advantage over the hand-picked on account of greater uniformity. In any consideration, this matter of uniformity probably is the most important single factor as far as the customer is concerned.

One of the most interesting developments of the last few years has been the increased attention that has been paid to developments of mixtures of coal for the steam trade. We seem to be breaking away from the practice of selling minus 2½-in. slack or minus 1-in. slack and minus ⅜-in. coal for pulverizer coal plants and are doing more along the lines of making the proper blend of the various sizes which will yield the maximum steam-producing results at the consumer's plant.

In many instances it has been definitely proved that control of the percentage of the fines with respect

Ash in the Sink From These Three Minus ⅜-In. Coals Increased a Little With Size, but Not For All Minerals Alike. Silica and Alumina Percentages Increased but Iron Oxide, Sulphur and Sometimes Lime Greatly Decreased as Sizes Advanced



to the coarse, both sizes having the same percentage ash content, has resulted in increased boiler efficiency, and the uniform nature of the fuel has permitted the operator to maintain his adjustments with a minimum of attention. This in itself decreases coal waste. In those cases in which it has been proved advisable to take out part of the coarser coal, there is an actual decrease in cost per net ton to the consumer, and he can still maintain results equal to, if not better than, he was getting with the higher-cost fuel.

In some cases where a high steaming rate is desired and the boiler is working under fluctuating loads, it has proved very desirable to reduce greatly the percentage of extreme fines, thereby permitting the use of greater volumes of air to support the necessary increased combustion.

To indicate how greatly raw 1-in. mine slack varies in coarseness, the figures in Table II are presented. They show the size variation in 113 cars of slack picked at random, screening at plus and minus ⅜-in.:

Table II—Size Variation in 113 Cars of 1-in. Raw Slack

Percentage of Plus ⅜ In.	Percentage of Cars
Under 35	8.9
35 to 40	6.2
40 to 45	16.8
45 to 50	16.8
50 to 55	19.4
55 to 60	15.1
60 to 70	11.5
70 and over	5.3
Total	100.0

On this series of cars the average percentage of plus ⅜-in. coal was 50.7 per cent. There are some uses for which a coarser slack—say, 60 to 70 per cent of plus ⅜-in.—will give better results, and on the other hand, for certain other uses it has been shown that down to only 20 per cent of the plus ⅜-in. will work more satisfactorily than the average slack. It is obvious that in this blending of sizes it is absolutely essential that the mixtures be uniformly maintained, and this is readily possible in a properly designed plant.

When we get down to the finer sizes, the minus ⅜-in. coal is generally sold for pulverizer purposes. There is another important factor that comes into play and that is the size range; if the percentage of plus 14-mesh drops much under 30 per cent, it is quite certain that there will be trouble in handling it through bins and chutes even when the coal is heat-dried.

Some of the principal factors in connection with the selection and design of a cleaning plant might be stated to be as follows: Characteristics of the coal; percentage of refuse in coal; quality and use of the final product; capacity of plant; climatic conditions; available mill site.

Characteristics of the Coal—The day of the ready-to-wear coal-cleaning plant is fast disappearing and the most successful future plants are going to be those in which the utmost care is taken to consider carefully how the particular characteristics of the coal to be treated may affect the cleaning problem.

By the characteristics of the coal are meant particularly its availability for separation, this being influenced by the percentage and specific gravity of the clean coal, the percentage and specific gravity of the middling or bone product and also the refuse. It is rather obvious that any one type of plant will not give the same result when working with a product with 90 per cent of clean coal at a 1.40 specific gravity and a high specific gravity and consequently high-ash refuse, as it will on a coal with 70 per cent of float at 1.40 specific gravity and with a carbonaceous refuse with low specific gravity and consequently low ash.

Some coals require crushing to free the impurities and others again are not helped appreciably by this treatment. As the percentage of fines—say, minus $\frac{5}{16}$ in.,—in the feed gives the most trouble in separation in either wet or dry plants, it is most certainly advisable not to do any finer crushing than that which is necessary in order to accomplish the desired results. Perhaps this is particularly true in the case of coal containing a large quantity of flour sulphur which, on grinding, tends to go into the minus 48-mesh material, for in that form it is very difficult to make a separation with any process except possibly oil flotation.

Percentage of Refuse in Coal—The influence of the refuse loss varies in different localities. For instance, if only 3 or 4 per cent of refuse is being wasted from the cleaning plant and this refuse contains one-third coal, it does not have the same effect on the cost as in the case of a plant with 15 per cent refuse and again with one-third loss of coal. In the first case the actual loss of coal is considerably less than the operating cost and in that case the latter is the most important factor.

In other words in a coal with a low percentage of refuse in the feed, the cost of operation is the more important, and in coal with a high percentage of refuse in the feed, it will be cheaper in the end to have a higher first cost for investment and a higher operating cost, in order to reduce the refuse loss.

Quality and Use of Final Product—Naturally, the desired quality of the cleaned coal is one of the most important factors in the selection of a plant, as it is a relatively simple proposition to get a separation unit which will do a good job of taking out the heavy rock but leave the bone and the laminated product with the coal, and it is this separation of the last part of the impurity, which closely approximates the specific gravity of the coal, which is the most difficult part of the problem. It is rather obvious to state that the nearer the operation must approach the theoretical results as shown on the specific-gravity tests the more care must be taken in selecting the cleaning units and in the design of the plant as a whole.

Capacity of Plant—The capacity of the plant has a certain influence on the design, for in a small-tonnage plant it may not be economically possible to provide any re-treating units, and while this is bound to result in a lower efficiency, at the same time, in many cases, the expense of re-treatment would be more than the gain derived therefrom. In the larger plants, however, this is not the case, as the efficiency of the process then becomes a more important factor in the cost, and it is difficult to justify an inefficient large plant except in those cases where the percentage of refuse is extremely low.

Climatic Conditions—To a certain extent, climatic conditions have some influence in the choice of a process and in design. For instance, in Alberta practically all the cleaning plants are using air methods, this being largely due to the extremely cold winters and the difficulties involved in handling wet-washed coal in such climates. However, there is a plant at Corbin, B. C., operating under the same climatic conditions using a wet-washing process, and heat-drying the fines before shipment. In certain parts of the West where there is no surplus of water it would be natural to favor the dry process solely on this account.

Available Mill Site—The influence of a mill site is not as pronounced in coal cleaning as in metal practice.

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MINE INSPECTORS

+ Exchange Plans for Promotion of Greater Safety

ALABAMA is testing the returns of all its gassy mines by analysis once a month, declared W. B. Hillhouse, chief mine inspector of Alabama, Birmingham, Ala., at the meeting of the Mine Inspectors' Institute of America, held May 12, at Columbus, Ohio.

In his paper, "Responsibilities and Duties of a State Mine Inspector," Mr. Hillhouse presented statistics showing that the fatalities from falls of roof and from gas ignitions in the state had both decreased materially in 1928 and 1929 from those of the preceding two years.

Quarterly inspections of each mine are required by the Alabama law, but it was found possible to examine all gassy mines practically once a month by confining inspections of non-gassy mines to just within the law. The department has a rule that in case an inspector is called away from a mine before its inspection is completed, he must report only on those sections personally inspected. It is recognized that it may take one man as long a period as twelve days to make a thorough inspection of the largest mine.

Answering a question by Lyman Fearn, chief coal mine inspector, Rock Springs, Wyo., Mr. Hillhouse said that in Alabama rock-dust samples are taken only at the discretion of the inspector and when visual inspection indicates a doubtful condition.

Frank Hillman, safety inspector, Woodward Iron Co., Woodward, Ala., said that his company had been rock-dusting for over two years and did not depend on visual observation in determining the adequacy of the rock-dust coat. Samples are taken almost daily. One man working in two mines takes air samples two days of the week and rock-dust samples the other four days. The standard requirement is 70 per cent inert matter in samples from the bottom alone and likewise for samples from roof and ribs together.

"Education is teaching a man to think clearly and logically," said H. E. Nold, professor of mining, Ohio State University, in a paper entitled, "Education and Safety in Mining." Speaking of miners' vocational night schools such as are operated by the Ohio State University, Professor Nold said such a course should be practical, but that the vexing question is, "What is practical?"

The comparatively easy coaching of a man to answer the questions usually asked in foreman and fireboss examinations is not education, and does not make the man more intelligent or a competent official.

Professor Nold said that he has noted reactions to the miners' night schools which clearly proved their value, such as requests for more advanced work and for schools in regions not hitherto served. These requests come from both operators and miners. Improved safety practices based on principles taught in the classes often are brought up for discussion. Mine officials have commented favorably on the increased ability in men who have attended classes.

J. J. Rutledge, chief engineer, Maryland Bureau of Mines, said men cannot go through the night course given by the state without learning to think. He believes that educational interests will miss a grand opportunity in the next ten years if they do not bridge the gap between vocational and technical education. Lot H. Jenkins, district inspector, Martins Ferry, Ohio, said that one mine improved its accident record 10 to 35 per cent after night schools were conducted.

P. J. Friel, state mine inspector, Shamokin, Pa., said that the schools have had a marked effect on safety in the anthracite field. From a mining population of 10,000 miners and laborers in his section, 275 students are now in attendance.

J. J. Forbes, U. S. Bureau of Mines, Pittsburgh, Pa., said that success in mining depends absolutely on safety, and during the last eighteen months the Bureau has received many reactions showing the safety educational value of 100-per cent first-aid training. From July 1, 1929, to May 1, 1930, 83,759 miners were given such instruction, and of this number about 65 per cent were trained by co-operative arrangements between the Bureau and mining companies.

At the morning session of May 13, L. W. Brown, oil and gas inspector, Department of Mines, Charleston, W. Va., outlined the status of that branch of inspection in his state. According to the West Virginia Geological Survey, 64,000 wells have been drilled in the state, of which 34,000 are still producing and 30,000 either were dry when drilled or have fallen off in production to such a degree that their operation is unprofitable. The law requires that, where wells are drilled through workable seams of coal, the location of such wells shall be recorded by the owner with the state department. The thickness of a workable seam has been set at 20 in.

When mining operations come within 500 ft. of any gas or oil well the mine operator must notify the department and at the same time must submit a map showing its mine workings with the projected workings beneath the tract and within 500 ft. of the well boundaries; whereupon he may proceed within a radius of 200 ft. He may not remove any coal within that distance until he has received permission from the depart-

ment and the approval of the well operator.

A vent pipe must be placed in wells penetrating coal seams from a point at least 30 ft. below the lowest workable seam to the surface, cement plugs being provided on the outside of the vent pipe from a point 30 ft. below each workable seam to 20 ft. above it. The intervening space and up to the surface must be filled with clay or other filling.

No fixed rule governs the department as to the size of the pillar; each case is decided on its own merits. In Marion, Harrison, and Monongalia counties, what is known as "the Consolidation rule" is followed, which has so far proved adequate. By this a pillar is left measuring 1 ft. in diameter for every foot of depth. Thus a pillar 200 ft. in diameter or 200 ft. square is left for a well 200 ft. deep and this is considered adequate for a well for any depth. Where the depth is 80 ft., the size of the pillar should be 90 ft. square; where 60 ft., 80x80 ft.; where 40 ft., 60x60 ft.

SOME good authorities, said Mr. Brown, would not require so much coal to be left, and indeed the loss of coal is considerable, for the average area of the pillars left to protect wells has been two-thirds of an acre.

E. W. Smith, chief state mine inspector, Ohio, read the discussion of J. C. Wilson, oil and gas inspector, division of mines, Columbus, Ohio. He said there were 5,000 uncharted wells in Ohio which were a great source of apprehension.

Mr. Brown said that doubt had been cast on the value of concrete. On dropping the aggregate down the well, the sand was almost sure to separate from the cement. Of course, the well was bailed dry above the plug before the cement mortar was run in. Segregation nevertheless was likely to occur. Mr. Brown said that it seemed to some that clay would be better than mortar.

Mr. Smith remarked that several men had been burned in Ohio by cutting into gas wells. He had noted that it had been said that the water flooding a gas well will shut off the gas as soon as it has been abandoned, but, he added, the statement is not true.

R. Dawson Hall, engineering editor, *Coal Age*, said that the danger was not so much in the draw itself as in the horizontal shears by which the draw was followed. If a strong, thick seam slipped in relation to another seam, the shear might sever the pipe if it were tightly wedged against the walls of the well. The pipe would be likely to bend with any other movement of measures, provided the steel was not too much corroded. Where surrounded by clay, the movement, whether of shear or of draw, would be little likely to do a good casing much harm.

Mr. Fearn, in a paper on "Mechanical Loading and Mine Safety," dealt with the specific hazards of mechanical loading and with the provisions being made in Wyoming to meet these hazards. Commenting on the large unsupported area needed for the operation of large loading units, he advocated the use of jack props that can be set in a few seconds. These props, which are used at a number of Wyoming mines, consist of a 4-in. pipe equipped with jack-screws that can be raised or lowered as occasion requires. This is extremely useful for Duckbill loading. Systematic timbering is making headway in Wyoming.

IN REPLY to a question as to the manner of using auxiliary fans he said that a separate fan with Ventube was used for each heading of an entry. The Sublet explosion probably was due to the misuse of an auxiliary fan. Mr. Fearn said that a quantity of carbon dioxide was generated in the mines of the Union Pacific Coal Co., so flame safety lamps were used to determine the presence of the dioxide.

J. F. Bryson read a paper "The Value of Publicity in Accident Prevention," prepared by John F. Daniel, chief, Department of Mines, Lexington, Ky. In February, 1929, the department began to publish and distribute to operating companies and safety directors a monthly report of fatal accidents showing in detail the cause of each accident and the recommendation of the district inspector.

H. T. Bannister, safety inspector, Madison Coal Corporation, Glen Carbon, Ill., opened the discussion. "Safety is a commodity which has to be sold like anything else," he said. It has to be sold to the officials first "and then to the men."

J. C. White, safety inspector, Raleigh Coal & Coke Co., Raleigh, W. Va., said his company calls its safety meetings once a month and, if the injured man is able, requires him to be present and to describe the accident. A committee of the operators' association meets once a month to investigate accidents. As a result, accidents have been cut to half.

"Methods of Preventing Mine Fires and Explosions," a paper by George S. McCaa, state mine inspector, Pittsburgh, Pa., dealt concisely with fundamentals. "The first safety feature of any coal mine for the handling and prevention of mine fires," said Mr. McCaa, "is that an adequate ventilation system be installed and controlled in the most positive manner for producing an adequate flow of air to all parts of the mine, without the liability of an interruption in the movement of the current. The mine should be equipped with strong, airtight masonry stoppings, and fireproof overcasts. All doors should be eliminated."

HE cited a fire in a mine where the officials were trained and equipped for such an emergency, and although the fire was on the main return it was promptly subdued and the cost was but $200. At another mine where experience and protective equipment was lacking, delay cost $400,000.

Discussing the paper, John T. Ryan, vice-president and general manager, Mine Safety Appliances Co., Pittsburgh, Pa., said that practically all explosions are caused directly or indirectly by some failure in the ventilation system and most fires are of electric or gas-explosion origin. Formerly, open flames caused most of the gas ignitions, but during the last ten years electricity has been the most frequent cause.

Mr. Ryan recommended rock dust as a most effective agent in fighting a mine fire. He said that using water on a hot fire is hazardous because the hydrogen formed greatly increases the explosive range of methane and air mixtures. With only methane there is no danger of explosion when the oxygen is down to 12 per cent, but if hydrogen is present there is danger even if the oxygen is as low as 5 per cent.

Mr. Ryan said fires have been fought by direct use of the dusting machine instead of by carrying the rock dust to the fire in sacks. He understood that the Old Ben Coal Corporation had used a rock-dust distributor twice in subduing fires, and Mr. Bannister explained that in fighting these fires the rock-dusting machine was taken in on the fresh-air side.

A complete and positive telephone system was suggested by W. L. McCoy, state inspector, Irwin, Pa., as an additional protective measure. He quoted an instance where a fire,

caused by the grounding of a trolley wire on a rail, gained considerable headway, but was extinguished by six or seven sacks of rock dust from an emergency supply of 25 sacks, before the fire truck reached the scene. He suggested the use of a permanent cross-bond in the last pair of extension rails at the face to eliminate the possibility of fires. One such fire, he had noted, was started by a current which passed through a car from one rail to another as a result of a grounded mining machine.

Mr. Bannister said that each mine of the Madison Coal Corporation has its own trained fire-fighting crew. He said he preferred rock dust to water as a fire-fighting medium. "Abandoned mines should be sealed and the crops covered with clay to prevent their taking fire," said Mr. McCoy.

Mr. Paul said that rock-dusting a mine makes the coal less easy to ignite and is beneficial to the roof by sealing the cracks and openings from mine air and moisture. "Good housekeeping is the best preventive of mine fires," said Mr. Glasgow. He is convinced that it is more important to rock-dust at the face than on the haulage, and if any place has to be neglected let it be the haulage. Rock-dusting should be done to the face or water should be applied back to the end of the rock dust. The 50- to 150-ft. danger zone at the face should be eliminated.

Mr. Ryan said that the quickest way to put out a large fire is by sealing, but that the fire should not be sealed gradually. "Give it plenty of air and then seal it quickly." He added that there is no explosion hazard in attempting to smother the fire with rock dust. He declared himself of the opinion that the use of water on the Mather mine fire would have been very dangerous because of the large body of methane that was gradually approaching it.

Ninety-seven registered at the meeting and the membership committee reported a gain of 62 new members during the past year. Richmond, Va., was selected as the place for the annual meeting of May, 1931.

Officers elected for the coming year are: president, L. W. Brown; first vice-president, Edward Flynn, safety inspector, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; second vice-president, E. W. Smith; third vice-president, P. J. Friel; secretary, C. A. McDowell, manager of personnel and safety, Pittsburgh Coal Co.; assistant secretary, W. B. Hillhouse; treasurer, J. J. Rutledge; editor-in-chief, James T. Beard, Danbury, Conn.

On Wednesday, the delegates visited the Museum at Ohio State University and the Stadium. At noon they were guests of the Jeffrey Manufacturing Co. They were entertained on Monday night by the Ohio manufacturers and dealers and on Tuesday evening by the Ohio coal operators.

FITTING PREPARATION To Meet Market Demands

(Continued from page 364)

where at times it is a most important factor. Its applicability to coal is only in cases where available level ground is very limited and where, accordingly, it may be more desirable to use the most compact type of plant possible, even at the expense of other features.

Much has been said and written about the relative merits of wet and dry cleaning. Because I am operating both types of plants, I have refrained from making direct comparisons, but it might not be amiss at this time to point out certain essential differences, particularly from a standpoint of performance.

Fundamentally, water is a better separating medium than air, due to its heavier density, and I do not believe that any serious consideration should be given to any claims that air methods can produce as exact a separation as can be obtained by wet concentration.

It is necessary to understand that the size limit to which it is desired to clean is one of the most important factors in making a choice of methods. An air table, handling minus $\frac{3}{8}$-in. feed, will do a reasonably good job of cleaning down to $\frac{1}{8}$ in., or 14-mesh; below that the separation practically ceases. When handling a larger size feed, the lower limit of cleaning is further reduced.

By wet methods it is possible to clean to 60- to 100-mesh, and by using froth flotation, coal can be cleaned down to 200-mesh. There are many cases where fine coal would be unsalable for certain markets if not cleaned lower than 14-mesh. This might be due to the concentration of sulphur or lower fusion point in the extreme fines.

The air table is particularly applicable to soft, friable coals where the fines are clean. This condition obtains in certain sections of the Pocahontas seam. Where the fines are dirty, it will be found that there is not much ash reduction below 14-mesh.

For dry cleaning it is particularly necessary to have dry coal; preferably not over 1.5 per cent of surface moisture. When the coal from the mines is alternately wet and dry, it will be found that the cleaned product will show a considerable variation in ash content, and it should be borne in mind that uniformity is the most important factor in coal preparation.

It has been the practice of some of our friends in the dry-cleaning game to stress the question of moisture involved in wet cleaning to the exclusion of all other factors. To the uninformed these arguments may have carried some weight, but in the large modern operation it is only a minor factor. It seems to have been overlooked that it is possible by heat to dry coal after wet washing.

The Champion No. 1 preparation plant of the Pittsburgh Coal Co., which is now operating at a rate of 300,000 tons per month, ships coal of fine size that is drier than the raw coal of corresponding size, as received from the mine. In other words, this wet plant is turning out a coal not only as dry as could be produced by an air plant but actually drier.

There are many places, depending largely on the characteristics of the coal, where the air methods of preparation are applicable and economical, but it is undoubtedly a fact that in the present stage of development the wet process offers the possibility of lower ash and greater uniformity in the market product.

SYSTEMATIC TIMBERING

+ Safety Theme at Rocky Mountain Meeting

SYSTEMATIC TIMBERING as the chief measure in the prevention of accidents from falls of roof and coal was proposed to members of the Rocky Mountain Coal Mining Institute at the twenty-ninth annual meeting, held in Denver, Colo., last month. Emphasizing the fact that half the accidents in coal mines are chargeable to roof falls, three of the speakers at the safety session on May 27 made systematic timbering the principal theme of their addresses.

Methods to be followed to obtain the full benefits and the advantages and disadvantages of the system were outlined by S. H. Ash, mining engineer, U. S. Bureau of Mines, Berkeley, Calif. How the Colorado Fuel & Iron Co. cut the number and severity of accidents at its Cameron mine by systematic timbering, backed up by strict discipline, was described by S. S. Temple, Farr, Colo. V. O. Murray, safety engineer, Union Pacific Coal Co., Rock Springs, Wyo., reviewed the principal causes of accidents in mines and steps by which they might be eliminated.

"The fact that in almost every locality approximately 50 per cent of the accidents are caused by 'falls of roof' shows that they have this one point in common," said Mr. Ash, "and it is natural to conclude that the remedy also is a combination of factors that can be summed up and applied in all instances to cover the situation as a whole.

Accidents from falls, investigation shows, invariably occur in the area between the working face and the point of loading. Irregularity in pillar lines or in the size of pillars, in seams of all inclinations, quite frequently results in accidents from falls. In deep workings especially, a regular pillar line is essential if the roof is to be controlled and "bumps" or "bounces" are to be prevented. "Another practice that contributes largely to bad roof conditions, which are manifested in falls in pillar workings, is that of driving rooms and leaving the pillars to be extracted later. Pillars should be drawn back from the face as soon as possible after the rooms have reached their limit.

"Mechanization has introduced new hazards, due to noise, and a frequent inspection of the face is necessary. More room is required at the face, which must be kept free of obstruction. If falls are to be prevented, safety props should by all means be set ahead of the track or conveyors, even if these are of a temporary nature and can be removed when mining machines are to be used. More timber should be used for mechanized mining practices involving loading and conveying machines.

"The remedy for accidents caused by falls," Mr. Ash asserted, "is to enforce systematic timbering rules through proper supervision, which must be backed up by strict discipline." Such rules should be based on slightly worse than average conditions, with no limit to the quantity of additional timber to be placed if conditions require it.

"At one mine," said Mr. Ash, "in order to see that the timbering rule is complied with, a 'safety man' is employed, who works directly under the general superintendent." He takes up the matter of violations directly with the miner. When such a violation is found, the miner's turn is stopped until the timbers are set and later inspected. If a dangerous condition is found, the safety man stays until it is corrected. More than one offense results in the discharge of the miner, a step which the employee organization readily approves.

At another mine all places are examined by the fireboss before the men go to work. He chalks rings on the roof where props are to be set to comply with the rule, and the miner must set them before going to work. If the roof is bad, the miner is not allowed to go in until his immediate supervisor can go with him and stay until the place is made safe.

"To some it might appear that the rule, in some quarters, is not accomplishing the good that it should." This is especially true where the safety inspector covers several mines, with the result that he cannot get over the ground he should. Where this is the case, "strict discipline is absolutely imperative, or more harm than good is likely to result, due to the tendency of some supervisors to leave the matter up to the inspector."

"In the case of day work, men will set more timber, because it is on company time, but in contract work they are inclined to set only what timber they believe they actually need at that time. This is the reason why more accidents occur per man-hour of exposure under piece work, when no systematic timbering rule is in force."

Education is a means of getting the miner to set timbers in the proper manner. A practice several years ago in one of the districts where single-stick timbering is used was to display the slogan, "A prop every 4 ft." on the screen at the town theaters. At one large mine, a radio loud speaker is installed at the mine portal. The men meet there every morning to take the man-trip and listen to a short safety talk by a man delegated for the purpose. If some-

one was injured the day before, the men are told how it happened and how it could have been prevented. Talks on the mining law and safety matters hit close to home, and rock falls and timbering are stressed.

Systematic timbering, carried on regardless of roof conditions, has the following advantages: Fewer accidents result from falls of roof; miners are not so prone to take chances in other directions; time is saved by the decrease in injuries and absenteeism in case of fatalities; workers' morale is strengthened, making the mine safer; falls in the working places, either at the face or away from it, are eliminated, with corresponding savings; dangerous conditions in pillar workings, caused by an inadequacy of timber, are done away with; smaller number of falls away from the face decreases controversy as to who shall pay for cleaning them up; time is saved and coal recovery increased in pillar removal, because fewer timbers must be set; less timber as a whole is required in any given area because of better roof conditions; miners take fewer chances in pillar sections, for the reason that an adequate quantity of timber must be set regardless of the fact that it is not necessary to work in the mined-out area; accident cost is reduced; human wreckage and dependency is eliminated; good working habits are promoted, as a result of standard timbering methods, and closer inspection is made obligatory.

Disadvantages of systematic timbering are: extra cost of timbering places with better than average roof; extra cost of removing props where this practice is followed; the labor cost of extra timbering falls on the company in day work; the careful miner spends time setting timbers that are not necessary in contract or piece work, and more efficient supervision is required, which can hardly be called a drawback.

Accidents due to falls of rock and coal were described by Mr. Temple to lack of a definite, systematic timbering system; inadequate supervision and laxness on the part of officials charged with this work; failure to instruct the men in regard to the rules made for their safety; neglect in following up accidents to determine definitely their cause, as a means of avoiding a repetition; and poor discipline and failure to post definite penalties for violation of rules.

Most miners are generally lax as regards their personal safety, and this inherent characteristic is a difficult one for the foreman to combat unless a systematic timbering program is laid down.

In a mine where systematic timbering is rigidly adhered to, the miner will invariably be found placing his props as the coal is loaded—and placing them according to the terms of the agreement. But to insure the success of such a system, the foreman and the management must be held responsible in addition to the miner.

Employment of enough firebosses to make an adequate inspection and the reporting of conditions to the mine foreman are necessary. As the foreman, by law, is in complete charge of underground workings, he has authority to discipline by reprimand, suspension, or discharge the man who violates the timbering rules. His decision should not be altered without his consent, and he himself should be disciplined if he fails to enforce the rules. Every man coming into the organization should be instructed in the rules of the company and the laws of the state.

> **To achieve safety, the following are essential: Everybody from the president down the line to the miner must believe in it; a safety organization must be formed and a safety code drawn up; absolute discipline must prevail; proper safeguards must be installed; every man must be made to understand the rules and regulations; first-aid training must be universal; and last, cleanliness must be observed—*V. O. Murray, before the 29th regular meeting of the Rocky Mountain Coal Mining Institute, Denver, Colo., May 27.***

"Finally, in linking the entire program into a solid chain, the rules laid down for the proper timbering of a place and the procedure to be followed must be definite and tangible. All employees must be given to understand that a violation will subject them to discipline."

Experience at the Cameron mine of the Colorado Fuel & Iron Co., shows that strict discipline has proved its value. In 1928, there was a total of 38 non-fatal accidents and no fatals. Of these 38, five were awarded compensation on the basis of total disability. The remaining 33 lost a total of 483 shifts, or an average of 15 shifts per injury. Of the entire 38 injuries, fifteen were caused by falls of rock and four by falls of coal at the roadhead. The five total disability injuries were from falls of rock at the face. The other ten injuries resulting from falls of rock caused the loss of 270 shifts, or a figure far in excess of the general average for the year.

A program of strict discipline was instituted in June of 1928, with an almost immediate reduction in both frequency and severity. Fifty-six per cent of the time lost in 1928 and 50 per cent of the total injuries were from falls which might have been largely avoided by proper timbering.

IN 1929, with the program well established, out of a total of 17 lost-time injuries, only three, or less than 18 per cent, were caused by falls of rock or coal at the face. Two of the three were from falls of coal, and one from a fall of rock. All of the injuries resulted in a total time loss of 233 days, 15 per cent of which was due to falls. Every injured man showed a complete recovery, which alone more than justified the effort expended. Compensation paid out or awarded amounted to less than 6 per cent of the total for 1928.

"There is no question about a safety program being expensive," declared Mr. Murray, whose paper was read by G. A. Brown, superintendent, Union Pacific Coal Co., Rock Springs, Wyo. "It is, as it produces no commodity, but when properly organized and with a definite goal, it will pay a dividend by increasing the efficiency of the human worker."

Coal-mine fatalities, continued Mr. Murray, are chiefly due to the following causes: falls of roof, face, pillar coal, and rock; mine cars and locomotives or haulage; explosions of gas or coal dust, and explosives. Mr. Murray agreed in the main with the other speakers as to methods of preventing accidents from falls, and added that probably the best and quickest way to get men to set timber and keep their places safe is to have a competent section foreman for every 25 or 35 workers.

Lack of clearance, equipment in disrepair, allowing men to ride on trips, and lack of cleanliness along haulage roads are the principal causes of haulage accidents. Adequate ventilation at the face will prevent a large number of explosions, the majority of which are started by an ignition of methane. Cutting and shearing places will prevent many accidents resulting from the use of explosives, as will improved blasting practices.

COAL AGE

SYDNEY A. HALE, *Editor*

NEW YORK, JUNE, 1930

Appoggiatura

EARNINGS REPORTS of 257 industrial and mercantile companies for the first quarter of the current year were 22 per cent smaller than in the first quarter of 1929, but 5 per cent above profits for the corresponding period in 1928. This compilation, shown in *The Monthly Review of Credit and Business Conditions,* issued by the Federal Reserve Bank of New York, covers reports from companies falling into nineteen groups of industrial activity. Only five of these groups showed larger profits for the first quarter of 1930 than for the corresponding period last year. These groups were the motion-picture industry; paper; printing and publishing; railroad-equipment concerns—and coal and coke. The seven companies comprising the last-named group reported net profits of $1,482,000 for the first quarter of 1928, $1,869,000 for the corresponding period in 1929, and $2,539,000 for the first three months of 1930. Little grace-notes of profit still embellish the sobbing dominant minor blues of the industrial pessimists—even in the lowly coal trade.

A wise beginning

A FIVE-YEAR PROGRAM of pure research in coal and the establishment and maintenance of a laboratory to carry on that work at Carnegie Institute of Technology has been made possible through the generosity of the Buhl Foundation of Pittsburgh and six great American corporations closely tied in with the coal industry. Under the program announced by Dr. Baker, president of the Institute, $50,000 will be expended at the outset for equipment and $75,000 a year will be available for fundamental research in coal and coal products. The plan for the new laboratory goes into effect next month.

That there has been a crying need for continuous, co-ordinated research in coal long has been recognized. "Coal," to quote Dr. Baker, "touches almost every phase of modern life. As far as we can see, it will always be the chief source of power, and cheap power is an essential to human welfare in our present civilization." Coal also has almost limitless possibilities as a raw material for processing, and much of the industry's hope for future profits and relief from competitive pressure in the energy market lies in coal processing or conversion in which the coal man has a direct manufacturing and financial interest.

Research is not a panacea for the ills of industry, but, as an organized endeavor, it does open the door to new methods, new products, new markets, new services, and new profits. Ambitious as the Buhl-Carnegie program is, it is only a beginning. In providing funds to carry on that program, the other contributors—General Electric, Koppers, New York Edison, Standard Oil of New Jersey, Westinghouse Electric, and United States Steel Corporation—have given a most practical demonstration of their faith in the future of coal. Should the coal operators, singly and as a group, show less confidence?

Prop yield a function of prop strength

WHEN a mine jack is adequate to support the load placed on it, it does not need to be erected so as to yield under that load, though authorities may, and sometimes do, question whether the coal will work at its best when the roof at a longwall face is supported rigidly. The Germans prefer to have considerable roof sag, declaring that, under the conditions in which roof collapse is prevented by complete backfilling when rigid support is provided, the desired face loading falls on the coal back of the undercut rather than on the face itself. This belief, and the practice to which it leads, may explain why, with all the backfilling, the roof in German mines still has a marked subsidence.

In America it is quite generally thought that, under the conditions providing for the collapse of the roof in the goaf, a stiff support described as "incompressible" gives the best results. It prevents crevices forming in the roof and makes it certain that rock will break off sharply on the line to which the jacks have been withdrawn.

An incompressible support, however, is never provided. The jacks may be virtually incompressible, but the floor and roof are not, and certainly the cap and bottom pieces have the quality of compressibility. If such a rigid support could be provided, however, it might be desirable. Some jacks have the strength to provide it where the cover is not too thick, but the four kinds of yield enumerated, two in the measures and two in the timber, will prevent the full load from falling on the jack even in that eventuality.

If the cover is too thick, however, the jack or prop must be ready to give way and to let the roof support itself on the coal, enough to reduce the load on the artificial support to a measure within its strength. Consequently, a light prop must have more yield than a heavy jack. It must shorten under the load so much that the roof will take all the load the prop is not fitted to bear. It is more important that a prop or jack yield when weak or

under heavy cover than when strong or under light cover.

A wood prop should yield almost as much as the roof would tend to come down if the prop were lacking, and a steel jack should yield as much as the roof would yield if the specific weight of the roof were reduced in proportion to the relative magnitudes of the weight of the roof over a given area, and the gross strength of the jack to which is committed the support of the lower roof over that given area.

A clear expression of this relationship is difficult indeed to devise; therefore an example may be offered. Suppose the cover were 200 ft. thick and the jack could support 100 ft. of it; then the jack, its top and bottom pieces, the roof slab, and bottom slab, in aggregate, should yield as much as the unsupported roof would yield if 200 ft. thick, and of a specific weight of one-half normal. A light prop must be given generous provision for yield, but with great depths all posts and jacks should be regarded as light.

Non-commercial analyses

STUDIES of coal characteristics need to be made by layers rather than by beds. All the present analyses are commercial in character. They are taken as a cross-section of the bed as mined and exclude those impurities it is expected will be removed at the face by careful loading. They also exclude such layers as are left as roof or floor. All of which is extremely practical—yet unscientific.

H. G. Turner recently published figures from which it may be deduced that the carbon-volatile ratio of Freeport coal runs from 1.37 for the attritus, 1.95 for the anthraxylon, and 2.53 for the fusain. This suggests that a common carbon-volatile ratio for the whole bed is no indication of the "rank" of its parts. The word "rank" should be used with apologies, for if the parts of a bed have different rank, that distinction is not conferred by time and heat but is inherent in the original coal substance. The Forge Split in the Mammoth bed has a carbon-volatile ratio for its attritus of 17.13, for its anthraxylon of 19.18 and for its fusain of 29.47, according to Dr. Turner's analyses.

Authorities express the opinion that fusain is of two kinds, one high in ash and one low. If so, it would be interesting to know not only where the fusain is found but the character of it. While chemists continue to examine beds on the commercial basis only, we cannot hope to get a clear conception of what coal actually is.

Dr. Turner's fusain is exceptional with its extremely low sulphur. In his bituminous coal the sulphur is one-fourth that in the attritus and one-sixth that in the anthraxylon, which makes the sulphur content as low as in the Rhode Island coals, though these are many stages ahead in their metamorphism. His anthracite fusain has only one-half the sulphur he finds in anthracite anthraxylon and attritus. These figures are so unusual that the problem it raises may well be submitted to the committee on Coal Classification of the American Standards Association that effort be made to obtain at least a few analyses of beds according to layers and that a careful determination be made of the respective percentages of anthraxylon, attritus, and fusain which those layers contain. In Great Britain, studies of this kind are already under way. The studies preferably should also be accompanied by paleontological examinations, and these latter should embrace the roof and floor as well as the coal seam.

To grope or to see

IN A RECENT ADDRESS at Leeds, England, Dr. W. Zwanzig pointed to the percentage increase in industrial production which accompanied better lighting. It ran from 4.4 to 25 per cent as a whole and from 0.022 to 0.085 with every per cent increase in light. All the industries mentioned, however, had some relation to more or less accurate vision, which in general is not needed in mining. It is too obvious that a good light is more essential in the threading of a needle than in the loading of coal. Consequently, experience in the manufacture of soft-metal bearings, heavy steel machinery, carburetor assembly, and spinning, to mention a few instances, fail wholly to convince.

To adopt the Latin phraseology, mining problems are of their own kind. Not so much light is needed, doubtless, but there is so little now supplied, that light is needed more urgently in mining than in any other industry. In the mine, every step is a guarded movement and is accompanied by a deliberate appraisal of the ground to be traveled. There can be for those working in the rooms of mines no permanent freedom from the tripping hazard. Roof rock, bone, and coal cover the floor; props, cars, and machines interfere with forward movement; and irregularities in the roof, natural and from the use of cap-pieces, threaten from above.

All these would be troublesome enough in the bright sunlight; they are many times more troublesome in Stygian darkness. When the eye does not get its impressions rapidly, but has to study closely the roof, the passageway, and the floor, because of darkness, time inevitably is lost. Just how much time one fails to realize, as acquaintance with the mines dulls the sense of these delays.

Stealthy movements become habitual, so that the fact ceases to be noticed by the man himself or by others, but the loss is no less because it is not registered on the mind. It hampers every movement just the same. One can check the restrictions of the miner by noting how much more is accomplished by workers who are engaged in similar work on the surface even where in everything but lighting the conditions are less favorable than underground.

WANTED: A MOSES

+ Apply, Fairmont, W. Va.

By WHITING WILLIAMS

Personnel Consultant
Cleveland, Ohio

"SURE, we try-'em plan!" So the Fairmont coal loader explained to me why he and his hundreds of companions had not together hired a lawyer to fight for the thousands in back wages owed them by a bankrupt mine company. "But one feller he wan' go dees way, and odder feller he wan' go odder way. No can."

"Just like us operators!" exclaimed the Fairmont manager who was listening.

Together the two remarks told the story of these last months in the Fairmont region, and especially of these recent weeks since the announcement by the Consolidation Coal Co. of its new wage policy and its 12 to 15 per cent cut in northern West Virginia—a cut almost immediately followed, as expected, by numerous retaliatory reductions to levels never before known by the present post-war dollar. Paying 37c. a ton for "machine-mined and drilled," the "Consol" is believed still to stand among the highest of the commercial mines. Of these, many of the "weight-payers," following their late May adjustments to the new Consolidation level, are now paying between 28 and 32c. per ton, while the loaders of some of the "car-payers" are believed by many to be receiving as low as 20c.—and less.

Due to the scarcity of work in the commercial mines, these cuts appear to have been accepted by the miners without disorder, though at one pit whose bulletin board of Saturday, May 31, announced that day labor would be lowered from $3.60 to $2.80, and other jobs proportionately, Monday's whistle failed to muster any workers.

Prices being what they are, this mine's resultant shutdown probably has meant slight loss to the operator. By the same token, the addition of his workers to the list of the district's unemployed, or under-employed, will hardly make any noticeable increase in the aggregate misery of an area whose present cup of distress runs over, quite without the further burden of its worry as to when and where the dreadful game of tit-for-tat is to be ended and the new wage bottom finally reached.

Starving coal miners are, unfortunately, not unheard of in America, but usually hunger is due to worklessness. It is something new in my experience to visit a district where not only the grocers but the merchants, bankers, editors, and operators alike stand ready to speak of miners who work anywhere from one to four and five days a week, yet whose net earnings nevertheless keep them and their families either in or near the bread line. Even the "supers" and the managers, helpless in the absence of orders, appear relieved to express their combined hope and wonder. "With the help of this last cut," explained one of these, "we ought to get a certain contract. But meanwhile, how—with lately only one or two days' work a week—how do they manage to exist?"

Many of the local mining companies, it must of course be remembered, pursue the even tenor of their lucky "captive" way, with their workers surely thanking God each morning for steady work at wages protected, for the present at least, from the deadly gnawings of the almost wolfish competitive hunger. But these establishments are not so numerous as to prevent the district presenting a picture abhorrent to every self-respecting citizen.

I REFER not so much to the hunger of thousands of local part-time workers as to the state of local public opinion created by their condition. I have worked alongside the coal loader enough to know how commonly he murmurs and mutters about the dishonesty not only of his employer but even of his own duly elected representative at the tipple scales. Nor need any careful observer take too seriously the discontented Socialists and their vociferous preaching of the "crimes of capitalism" to increasing crowds in the locality. But it is a new experience to find, as I have lately found in the Fairmont region, the members of every part of the local community, from top to bottom, completely persuaded that this operator or that one regularly gets most of his present profits from the coal stolen from his miners on either his mine cars or his tipple's scales!

I'm not saying that I believed these stories. That's not important. But it *is* important that whole communities of average, self-respecting American people *do* believe them. Undoubtedly, such public impressions and convictions bud and blossom in the frequency with which receivership follows receivership, and especially in the widespread rancor created when the bankrupt is shortly observed to be the real purchaser of some other mine.

The public repercussions of all this experience are, quite naturally, enough to persuade the district that somewhere, somehow, a Moses must be found equipped to lead it into a better era—and soon. The trouble is that no unanimity whatever appears to exist as to just which Moses it shall be.

Some suggest that member of the Moses family surnamed Uncle Sam. His leadership would, of course, include not simply Fairmont and West Virginia but the entire country. Forthwith, these believe, the present destructive competition would cease—a consummation devoutly to be prayed for, in spite of its forcing some hundreds of thousands of miners to seek work elsewhere. Not many taxpayers and fewer business men, however, appear to view this Uncle Sam Moses with anything but misgivings. But, it is signifi-

Whiting Williams, who here surveys the economic situation in the Fairmont district for *Coal Age*, brings to his work a broad background and sympathetic understanding of industrial relations. Trained at Oberlin, Chicago, and the University of Berlin; assistant to the president of Oberlin for eight years; executive secretary of the Cleveland Welfare Federation for five years; Mr. Williams threw up the routine duties of personnel director and vice-president of the Hydraulic Steel Co. to spend four years as a common laborer in the coal mines and steel mills in United States and Europe. Since that time he has written and lectured extensively on industrial relations.

cant of the present Fairmont situation that this solution appears to have made a surprising number of (mainly secret) converts among even the operators.

Far more general is the local interest in the coming—and the acceptance—of someone who would furnish the money needed to perfect either an operating or a marketing merger—call him, for instance, Wall Street Moses, or perhaps John D. Moses, Jr. Naturally, it is recalled that years ago in Cleveland a similar measure of wolfish competition—and wolfish morality—in the oil business was changed to order and regularity by the formation of the Standard Oil. Unfortunately, it would seem that such a Moses today would need more money—also more faith—than then.

"Back in late '25 or early '26," so one operator puts it, "we got so far as to have on the table an impartial engineer's appraisal of the various larger properties. Separately, every member agreed that the figures set for his holdings were fair and just—until he saw the equally unbiased valuation given by the engineer to the assets of this or that of his disliked or distrusted competitors. With that, it was all off."

"The moment talk gets around of any active get-together," said another, "this man or that puts seven prices on his acreage—and the new merger baby dies aborning."

PERHAPS even more to the point in an understanding of the difficulties the hoped-for capitalistic or managerial Moses would face, is this testimony as to the prevalence of a disease known nationally as *prima donna-itis:*

"I have sat in many meetings which discussed some way of turning toward the preservation of the district the knives now turned too often toward one another's throat. The local operator who was also a local owner appeared more willing to merge his vested interest in his coal than was the local manager, representative of absentee owners, willing to merge his vested interests in his personal job and salary. 'What I want to know,' these local managers were too likely to say, 'is where do I come in in the new set-up?' I have often wondered what would have happened if his bosses—the actual owners—had sat in with us."

More recently some of the area's leaders have been discussing the possibility of interesting the local railways, banks, and public utilities in protecting themselves and their district by means of a bond issue sufficient to put at least most of the competitive production under one management. In spite of the presence of glass and other industries, the importance of coal certainly makes any such project a matter of entirely proper concern and co-operation to every local financial enterprise.

Meanwhile, it takes no great intelligence to understand why so many of the district's miners and their leaders find time, even in the midst of their troubles, to take a certain secret satisfaction. The dire prophecies of their Big John Lewis Moses have come to pass. "All the bad things we miners used to suffer before the union came," said a loader who is now busy on the railroad section but whose heart still lingers lovingly in the mine, "are either back again, or just around the corner. That means either broken and worthless miners or else the whole fight over again."

Naturally, nothing in the way of a seriously organized strike is to be expected until more regular work gives the strikers interest in something besides the union's commissary truck—unless it should happen that years of such bottom-scraping as is now in progress produces the guerilla tactics of unorganized and desperate revolutionaries. But on all sides a well-organized strike is looked for the moment the industry enjoys so much as a whiff of prosperity.

Nevertheless, although a surprising number of both operators and innocent but not unharmed spectators now wonder whether union disadvantages outweigh the advantages of controlled wages, few unbiased citizens believe that the milk and honey hoped for by miner and operator alike is likely to be furnished by one John Lewis Moses. Even though the industrial chaos he visioned has arrived, few stand ready to praise his over-loyalty to a wage scale so far out of post-war economic reason as was Jacksonville. It must be admitted, however, that the defeat of Judge Parker is likely to make considerably easier than before the unionization of fields heretofore kept invulnerable. Furthermore, the achievements of Hillman and his Amalgamated Garment Workers in stabilizing the men's clothing industry and the success of the B. & O. plan of manager-worker co-operation have made such industrial history as any troubled mine-runner well may read.

Straight thinking, therefore, requires, whether anybody likes it or not, facing the fact that unless conditions of wage and work—and weighing—improve, the situation might well compel accepting, if not a John L. Moses, then perhaps at least a Labor Moses—someone fortified with a more nearly national membership and power for opposing chaos than ever before known.

If that is to happen, Fairmont and other bituminous districts now in similar condition are likely to have much to do with it. Regardless of personal likes or dislikes, operators so situated are likely to be surprised before long to find themselves under something like nation-wide pressure for union acceptance exerted by the ordinary citizen and especially the ordinary manufacturer—*unless* some other method can be found for giving to the miners a buying power considerably higher than the now too frequent sub-bread-and-butter level. The American public does like to buy cheap, but, after all, it is too fair-minded to enjoy warmth purchased at the price of its diggers' shiverings.

SURELY, before the coming of such pressure in the direction of either the government or the labor solution, it would seem that some Merger or Manager Moses could be found against whom the constituent operators would not forthwith make excuses. Most of the opposition is said to come from the small operator, though few seem to know just who he is; one such placer of blame was himself producing a single car per day! But, conditions being what they now are, even such a producer should have slight difficulty in understanding perfectly how altogether outdated is the district's catch-as-catch-can variety of individual marketing—how completely the modern merger has lessened the number of coal buyers and how cunningly these modern mass purchasers of coal have, quite apart from the ubiquitous broker, used their trade associations and other tools for solidifying their buying technique.

Such widespread unity or near-unity of purchase would of itself, so any outsider would think, suffice to persuade vastly more operator unity of sales, if not of production. At the very least, the mounting pressure of such buyers ought surely to induce the hiring of accountants who would occasionally remind the seller to include the cost not only of his wages and salaries but also his coal—though it looks now as if the industry is frankly abandoning all thought of cost. At any rate, such pressure would appear sufficient to shatter one of the most potent of the arguments used against the suggested co-operation—namely, the Micawber-like dream still nourished secretly in many otherwise reasonable operator bosoms, of high profit coal—of "maybe some time soon, $10 coal!"

PUBLIC ANNOUNCEMENT by the Consolidation Coal Co. that wage cuts by competitors in northern West Virginia had compelled that organization to reduce its rates of pay there to escape continued economic isolation has thrown the spotlight on this sorely distressed region. What are the conditions which impelled this action? What will the repercussions be? How do the workers feel? What is the way out? These are among the questions discussed by Mr. Williams in his study of the Fairmont situation.

NOTES

. . . from Across the Sea

MANY indictments are brought by the British engineers against wood as supporting material for mine roofs. Inadequacy, unreliability, impermanence, insufficient recoverability, insufficient reduction in length to accommodate itself to roof movement, combustibility, air vitiation are a few of them. During the war, props were expensive and difficult to procure, and they are still unduly costly. Now that the change is being made to steel, some of the desiderata do not always seem to be kept in mind as they should be. In fact, the true theory of prop construction appears not to have been written, and perhaps the facts on which it should be based are not sufficiently determined.

Most of the steel props are adequate, or reasonably so, to cause the roof to break outside the line of the prop row. Most of them are reliable, but some are recovered only with more difficulty than is desirable. The steel prop should be made to collapse with the blow of a bar from a distance, and the collapse should be immediate and certain; yet it should not occur accidentally. The props also should be readily fitted to the distance between floor and roof, and with some it seems that to get the exact length might be a matter of some difficulty.

A prop readily adjusted is likely to be promptly placed. If the placing of a prop takes time, its placement may be delayed, not only by reason of a habit of procrastination but also because it cannot be placed the first time the effort is made. Maneuvering under a bad roof, even to erect a prop, is the height of risk. If props can be put up in a jiffy, the roof can be kept from sagging and from becoming creviced and unsafe. With proper material for support, it will not be necessary to take down roof that might have to be removed with props not so adequate or so rapidly adjustable. Thus labor will be saved and the gob freed from the broken rock which too often makes prop withdrawal difficult.

The time element in placement and the ease of displacement are two primary qualities in mine props. Reliability, incombustibility and freedom from air vitiation are reasonably well attained by all steel posts, except that some are subject to unsuspected tripping by falls of rock. But steel props vary greatly in the two properties set forth at the head of the paragraph; and improvement in these qualities are the more necessary if steel is to replace wood, because means have been found to make wood props more readily removable. Wood props used to be shot out, cut out, or hammered out. Then came the Sylvester and other prop pullers, and the props were pulled—from a distance. But this required a heavy pull, and it was found that if the pull was made off the axis of the prop, the twisting action made its removal less difficult.

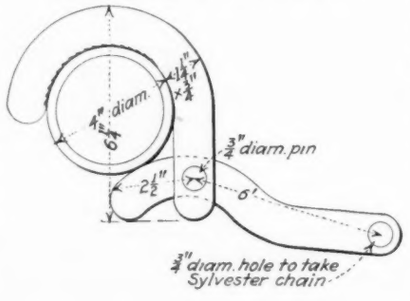
But this arrangement was still more readily available for steel props, which could stand a considerable twisting action. With the modification shown in Fig. 1, the twisting radius is almost 9 in. This device much resembles a pipe tongs. In a recent note in this section, I described a device for removing a prop by an eccentric pull of somewhat the same character but of less radius.

Robert James, at the South Wales Institute of Engineers, in Cardiff, Wales, described the various types of props that have been introduced into Great Britain, and concluded his article with the statement that he "is inclined to think that there is no need for the more elaborate and complicated type of steel prop. It is probable that some form of rigid prop employing the yield of a timber block and the usual lid used in connection with correct spacing will eventually be found to meet all requirements."

Mr. James shows four props, one the Johnston, depending on a wedge contact of its two parts, the two wedges being held together by a sleeve which in his illustration reproduced here seems to hold itself in place. It will be noted that the prop design dates back to 1861 and constitutes the first steel prop. It may, therefore, not be in use today. It is interesting as being on a somewhat similar principle to the American steel jack known as the Lorain, but that has two wedge surfaces and is held in place by a cam.

The Morgan prop—one of the four posts mentioned above—has two pieces of T-iron, a top and bottom member, placed back to back. The top member rests on a base, which in its turn is set on a wood post. By a forked toggle lever of suitable design, the connecting clip at the back can be lifted, separating the two members and permitting of the collapse of the prop. The Connel post, in use for some time in the Grosfaen and Great Western collieries, consists of a length of steel rail or joist with a steel stirrup of forged or cast steel fitted to its lower end and so arranged that a piece of timber of rectangular section and suitable length can be inserted, thus bringing the prop to the required height.

Fig. 1—Tongs Twist Prop Free



When the prop is placed, a cap piece usually is placed above it and a foot piece below it. The top of the steel rail or joist is cut across at the top on an inclination of 1 in 6 and fitted with a tapered steel cap attached to an arm which rotates on a pin in the flange, which pin is off center in the direction in which the prop is to be released. The hole for this pin is made oval so as to permit the steel cap to rest correctly on the top of the steel rail or joist. When in position, and during erection, the steel cap is held in position by a wedge clip which binds the stem of the steel cap to the flange of the girder. A blow of a hammer releases the wedge clip, and then a hook connected with a Sylvester prop puller is attached to an opening cut in the rail or joist, or else to a link riveted to the web of this member for that purpose. The pull of the Sylvester releases the post.

The prop is purposed to give through the cap and base pieces and the bottom block a certain degree of compressibility without destruction. It is stated that with a load of 18 tons the rectangular block shortened 4.375 in. and the top and bottom pieces 3.825 in., a total of 8.2 in. The block was of spruce 6 in. long and 6x2¾ in. cross-section and was placed in the stirrup at right angles to the direction of the load. The top and bottom pieces were of 3-in. timber. The load was released after reaching 18 tons.

The Rasbridge prop is a pointed pipe prop hinged in the middle so as to be easily withdrawn by being struck or pulled in the center in the correct direction. On the opposite side of the pipe from the hinge, a plate is provided with a pin to prevent premature buckling. A steel cap is placed over the upper end of the pipe. This prop gives under the load by being forced into the bottom.

The desire for some degree of adjustability of length is discernible in all British thinking. Evidently in Great Britain there is no recognition of the theory so generally held in the United States that the roof should be firmly held near the face, with the intention that no crevices will form in the projecting shelf over the longwall or longface and that sharp breaks will occur at the edge of the jack row. That theory may be right if the posts are strong enough to hold the entire load from the coal to the surface, but if they are not, plans must be made for either the props, their caps and base pieces, the floor or the roof to give way under the load. A small rail, or joist length, can continue to function only so long as it does not attempt to support the entire roof burden.

Mr. James shows in his article many sand and fine-coal jacks, and he ex-

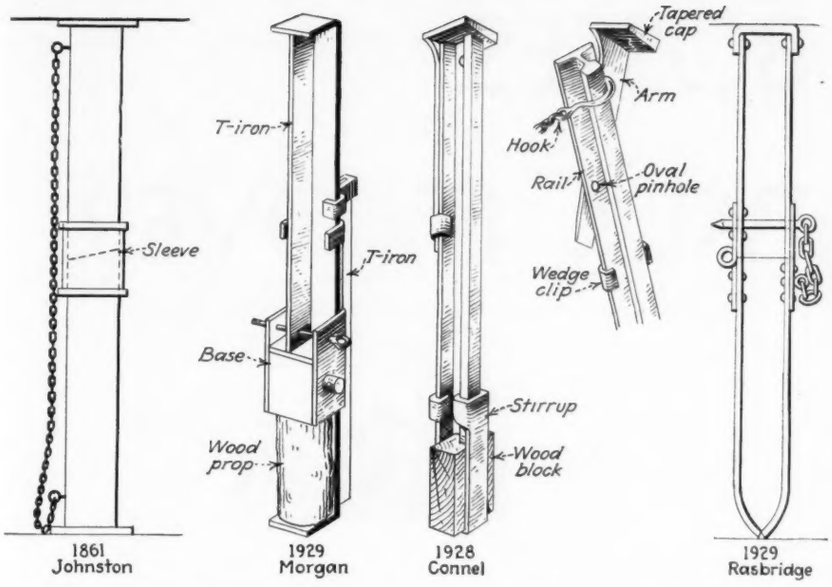


Fig. 2—Four Collapsible Props

plains that the sand can be made to fall in the jack and move upward through release openings by rapping on the exterior of the pipe. Such gentle suasion on fine material is more effective by far than pressure. This quality of fine material is utilized in freeing the props before removal. Four of the props, illustrated, have screw tops: the Baron Masham, the Mannesman, the Reinhard, and the Baird. Of these, the Baird is of recent introduction.

Some props, those with screws being notable exceptions, seem better designed to hold the load when set than well fitted for rapid erection in coal of varying height. Where small wood blocks are used, however, it would be possible to have many of these blocks on hand of varying length, but one wonders sometimes with the sand or fine-coal cushion prop, how easy it is to gage just how much sand or small coal should be put in a prop to make it of the correct length for shouldering its proportion of the load under compression. In fact, that is a virtue of the incompressible prop. When it is set up, it is quite clear just how much timber must be set over it to bring it up to the roof. This provided, an equal roof descent will bring an equal load on the jack unless the cap pieces and bottom pieces are in one case much thicker than in another, or the timber of unequal compressibility.

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On the ENGINEER'S BOOK SHELF

Scientific Management in American Industry, by the Taylor Society; H. S. Person, Editor. Harper & Brother, New York City. Price, $6.

In this book the Taylor Society, under the editorial direction of H. S. Person, "has drawn upon the practical experience of a group of 26 experts to make this book an authoritative and definite introduction to the modern science of management." As stated in the preface, this work was designed "to meet the increasing demand on the Taylor Society for a comprehensive treatise on scientific management."

Three chapters, which cover concisely the historical background of scientific management, its philosophy, its practical results, and a 1929 statement of principles, were written by Harlow S. Person, managing director of the Taylor Society. As is usual, because it can hardly be avoided, Dr. Person's history of scientific management revolves about Frederick W. Taylor; his work, his ideals, and the system of management he founded have been interpreted and treated in the light of present-day conditions. It is in such manner that Dr. Person has ably handled the human side of scientific management and its relations toward labor.

Part VI of the book is devoted wholly to industrial relations and the place of well-organized personnel work in industry. Truly, any plan of management that seeks out the facts and causes must be well rounded and turn toward labor management that same intelligent effort that was given to technical processes and production. It is in this respect that this book is evenly balanced.

In 24 chapters, all well illustrated, is shown the application of scientific management to sales, production, finance, and the newer treatment of labor under personnel administration. All the work is well documented and an extensive bibliography is included. A book by 26 authors does not make for easy reading. The breaks from chapter to chapter are abrupt. Such an arrangement must have its compensation, for, as Morris L. Cook said in the preface, "the time is past, of course, when any one individual can cover the whole of industry as a master."

The compensation for the separate authorship plan is a great body of ideas and factual material, the authoritative character of each chapter, and the intimate personal knowledge that each author is able to put into his article. For instance, H. S. Dennison writes of scientific management in terms of production, sales, labor, and financial problems of the Dennison Manufacturing Co., a notably successful company of which he is president. Then, too, there are Howard Coonley and Joseph H. Barber, president and assistant to the president, respectively, of the Walworth Manufacturing Co., who, when they write of budgetary control for production, sales, and finances, treat of these subjects in the light of daily experience.

It is to be regretted that all of the mineral industries were omitted. Could the sponsors of the book find no worthy examples of scientific management in either coal mining or metal mining? The reviewer believes both the mineral industries and the book lost by the omission. It must be remembered, no matter what terminology be used, that management in the coal- and metal-mining industries has made progress in the past few years.

What constitutes the structure of scientific management? If it be market analyses; budgeting for operating and administrative control; the use of time studies in making production and operating analyses; wage incentives based upon accurately set production standards; planning, scheduling and control of operations, increasing mechanization or personnel administration, then the mineral industries had a rightful place in the book. What has been the result of such a management program to the coal industry? Reports of presidents of several large companies to their stockholders during 1929 contained this significant statement: "In the face of declining market prices your company has made satisfactory progress; modernized plants and increased operating efficiency has contributed to lower operating costs."

The preface of the book states that it is not directed to those who need to be convinced of the basic soundness of the philosophy but to those who, having accepted that philosophy, desire to know more about the technique of successful management methods. Even by this test the mineral industries still deserved a place in the Taylor Society's symposium of scientific management in American industries.

JEROME C. WHITE

THE BOSSES TALK IT OVER

Job Analysis— A Key to Man Training

"WHAT are you reading there, Jim?—O, I see it's *Bosses* letters," exclaimed Mac, on calling at the super's office and finding him reading *Coal Age*.

"Yes, Mac; I'm at it again. Here's a letter in the April issue you ought to read—I mean *study*. It's a letter on job analysis by Bill Moorhead, a super in New Mexico. I've been at it a long time. I'll bet I've gone over it a dozen times; and the more I analyze it the better I like the ideas shooting from it. For pure, unadulterated logic on man training, it's the goods."

"It must be there, Jim, guessing from your tickled enthusiasm."

"Check and double-check," agreed the super. "In discussing job analysis, Bill says: 'It discloses opportunities for organized training and improvement.' That's only one of a couple of dozen reasons he gives for job analysis."

"Looks like we can use that material quite handily in our training work, Jim."

"Exactly, Mac. I've been fumbling for an idea to tie in and extend our foreman training to worker training. Bill here gives me a stack of ideas, ready for use. From now on we analyze—the workers' jobs and our own. When we teach the men how to do things, we'll analyze. Pretty soon we ought to have them figuring the things out for themselves."

WHAT DO YOU THINK?

1. *What do you see in Mr. Moorhead's ideas, as told by himself and summarized by Jim?*
2. *State specific examples where job analysis has been unusually beneficial.*
3. *Should time be spared to train men individually at working places by analytical talks?*
4. *Is there any other way to make a man see what you are driving at?*
5. *How will the man view painstaking, analytical instructions?*

All superintendents, foremen, electrical and mechanical men are urged to discuss the questions on page 376. Acceptable letters will be paid for ▶▶▶▶

WHAT PRECAUTIONS DO YOU TAKE to minimize labor turnover at your plant? This problem was thrust to the attention of Mac and Jim in May. Suggestions for the solution of this problem are made by readers of *Coal Age* in the letters following.

Hail to the Cheerful Boss!

HAVE YOU NOTICED how much material the new man will spoil? He gives belting, machines and tools the strain of their lives. These frequently break while in "green" hands. If you make a compilation of the cost of these items you will find the total startling. Foremen who have studied this problem generally agree that labor turnover is highest and troubles worst when unskilled labor is employed to do difficult work, especially when these men are assigned to high-priced, complicated machines or tools. No doubt you have found that it is these jobs that take more of your time in breaking in a new man and that require more careful follow up.

How long does it take before the newcomer produces as much as the regulars on your force? Usually, it takes months for him to attain par, even if he is a man of better than average intelligence. The cost of turnover is no small item. Every new man requires special attention, which keeps you from giving proper scrutiny to the regular working forces and to other important matters. All these items cut deeply into profits. Examine the records of different departments or sections. How often do you find that the sections with large labor turnover fail in the production of quality and quantity?

The new man is green in many ways and, what matters most, is a stranger in your organization. No doubt you have sweated to build up your force into a well-oiled machine. When you have fairly gotten it where it operates smoothly, along comes the newcomer to disrupt your accomplishments. Your men feel that he is an outsider and they stay cold to him until he shows his stuff; probably they fear or suspect him for some unknown reason; or perhaps they figure that he may become a drawback to them.

Now here is where the open-minded foreman shows himself a tower of strength and light in his job. Here is where he demonstrates that he belongs to the progressive, rather than to the dud, end of the industry. If you permit the newcomer to feel himself an outsider, he will take little interest in your department or section, but will confine his interests to himself alone, and care not a penny's worth about your problems of production and cost.

The better foreman finds that it pays to break the ice early. He makes the stranger feel proud that he is a part of the organization. He realizes that he must reach the man if the newcomer is to help build up the organization. Reaching him takes infinite patience and time, of course. But the ability of the foreman to win him finally draws the line between the ordinary and the better foreman.

Labor turnover behaves like a rolling ball of snow. When good men leave you, they take others with them. When a boss loses strength in his following, he is likely to find that he is receiving job applications from only outcast workers. A company is always known by the foreman it keeps.

If you get into this fix, there is a way out. First of all, a fellow has to be cheerful. Results at first may not be forthcoming, because your men will not understand your change of heart. They may question your sincerity. But keep on trying to win them over. After a time you will succeed. Then it will be a pleasure to act as a foreman, because by that time your cheerfulness and enthusiasm will have become contagious. Cheerfulness is one of the least expensive and most attractive assets a foreman can take into his section. It is the capital of a foreman, which should be paid out to open the mind of the grouch and make even the most unintelligent anxious to learn.

The men learn to put confidence in you. They come and tell you in brief, friendly chats what is on their mind in the matter of personal problems, little worries, and the difficulties of their job. You are the very center of their living during the better part of the day. It is well to remember that the way in which a foreman knits together an organization determines in large part the happiness of many men.

The foreman who is able to keep his men and abolish turnover is some foreman. He gets a real kick out of the job, too. His section operates as a pink tea affair in a congenial atmosphere. Avoidable seepage of men should be found and stopped. The leaks can be caught by wise foremanship, but no general rule may be laid down to apply in all cases. The determined trouble maker, the misfit, the few who are incapable of learning—in fact all those who represent financial losses to the organization—must be eased out. No foreman wants his department turned into a waste section for work travelers. Transients are a nuisance; they are an expense; they are costly producers.

Many factors, of financial and other character, may have an effect on labor turnover, but perhaps the most important is the relations of the foreman with the worker. Some foremen do not seem to realize how much their own personality has to do with keeping down labor turnover to reasonable limits. One of the reasons for this is that workers, on leaving a job, seldom give their real reason for quitting. While it is true that men are sometimes questioned by the boss in an attempt to find out the trouble, in order to correct it, the worker seldom gives his real reason for leaving.

For one thing, a man with his final pay check in his pocket, and possibly a family to provide for in a hurry, has his mind set ahead to the next job. He may even think it is childish to admit that he can't work with a certain foreman, so, to close the matter quickly, he is most likely to say that he is getting more money at the next place. This probably is the reason that the pay envelope has come in for a lot of blame for high labor turnover that could more justly be laid to the relations existing between workers and foremen.

If 100 workers would honestly give their real reasons for liking or disliking their jobs, it is pretty certain that 95 of them would mention high or low regard for the foreman. Careful consideration will show why this is so. Generally, the foreman is the only representative of management who is in close contact with the workers, so the workers' impressions of their employer depend largely on the personality of the fore-

Thinking Ahead

"Don't cross the bridge until you come to it" is an axiom which, in the sense of its most liberal interpretation, is not practical. It suggests that you close your mind to worries which, too often, are confused with thinking. Only when it is muddled is thinking a worry. Sound thinking actually is a sedative to worry. These remarks have a direct application to your job—if you think out your job, you won't worry over it. Job analysis, scheduled for discussion in the next issue, merits attention from your pen.

man. Workers will stay with a foreman they like even when the wages and other conditions are not the best. By the same token, the paying of high wages won't keep good men on the job if the foreman has a bad disposition. He may be stand-offish or shifty. He may make promises he can't keep. He may not consider the suggestions made by the men. But none of these failings is likely to drive men away from a foreman as much as a feeling that he is playing favorites.

The odd thing about this situation is that the foreman may not know that he is damaging himself by his actions and, to quote a famous advertising slogan, "His best friend won't tell him." In addition to being equipped with a knowledge of mine operation, a foreman must be a good human engineer.

Hazleton, Pa. JOHN J. CHIRE.

Good Wages Will Lessen Heavy Turnover in Labor

WAGES should be given first consideration in attempting to keep miners and their families satisfied. If a man cannot make a good living, he and his family soon become discouraged and possessed with a desire to make a change. Good men are not satisfied with a "near" living. When one good man becomes disgruntled, you will notice that several of his close friends are ready to leave with him.

Another important consideration is living conditions. If a man is furnished a good house and ground for a lawn and garden, with well-kept streets and sidewalks, he will be inclined to stay. After all, miners are at least part human, even though some people seem to think —as judged by their views—that a coal miner eats hay.

But under the present system followed by coal companies to get business, such as trying to undersell the other fellow regardless of consequences, it is impossible to keep wages where they belong for jobs as dangerous as those in coal mining. Idle time also is a big handicap to holding good men. In hiring new men it is important, I think, to put the facts squarely up to them. Their hopes should not be built up with promises that cannot be fulfilled, for when a new man goes on a job expecting what is promised to him, and finds his hopes blasted, he immediately becomes dissatisfied. Impossible promises only create bad feelings.

A foreman can almost always tell a man who is likely to stay from the one who is looking for a road stake. My honest belief is that a mining plant is better off shut down than in operation with men who are not interested in the future of the mine. HOWARD LONG.

Pierce, W. Va.

Management, Not the Men, Responsible for Labor Turnover

IF Jim and Mac are having a high labor turnover in these days of wide unemployment, there is need for a change in management at their mines. The trouble lies not so much with the men as it does with the management. In my experience I have taken charge of more than one mine where the management reported a shortage of good labor and a surplus of poor workmen as the cause of high cost and low tonnage. By using good judgment and common sense in these instances, I succeeded in increasing the tonnage and lowering the cost in a short time without greatly disturbing the working personnel.

Naturally, a foreman should be a good judge of men. If he has that knack, he will be able to spot the good and the sorry worker nine times out of ten. If you have built your organization on a solid footing, you will never be in a position where you will have to hire every Tom, Dick, and Harry that comes along. I have managed mines in fields where foremen and supers were always growling about labor shortage and labor turnover, while I had a plentiful supply of good men. The trouble is that most of us try to excuse our laziness by laying it on the miner.

The Old Man should have found out the cause of cost-jumping two years ago. The chances are two to one that the cause of the trouble did not grow out of labor. When owners quit accepting excuses from weather prophets and chair warmers, there will be fewer bankruptcies in the coal industry.

WALTER HORNSBY,
General Foreman, Glogora Coal Co.
Glo, Ky.

Why Employ Mine Foreman Unless a Finished Product?

A COMPETENT mine foreman, in my opinion, is one who has thoroughly mastered the technical and practical aspects of mining, and who has confidence that he can give his employer a maximum output at a minimum cost. Such a man has executive ability. He knows when coal is cut and shot properly, when timbers are efficiently placed, and ties properly imbedded and spaced. He knows the correct weight of rails to use in tracks. He sees that his fan is functioning to advantage, that the stop-

Publications Received

Coal Mine Fatalities in United States, 1928, by W. W. Adams. Bureau of Mines, Washington, D. C. Bulletin 319; 125 pp. Price, 20c.

Analyses of Maryland Coals, by Edward B. Mathews. Bureau of Mines, Washington, D. C. Technical Paper 465; 89 pp. Price, 15c.

The Use of Chains and Other Gear for Hauling and Lifting. Mines Department. Safety Pamphlet No. 6; 48 pp., illustrated. Price, 6d. net. H. M. Stationery Office, Adastral House, Kingsway, London, W.C.2, England.

Report on Pollution Survey of Cheat River Basin, by L. V. Carpenter and L. K. Herndon. State Water Commission, Charleston, W. Va. Pp. 46; illustrated.

Analyses of Iowa Coals. Iowa Geological Survey, Des Moines, Iowa. Pp. 19; illustrated.

Safety as Affected by Supervision and Discipline, by A. U. Miller. Bureau of Mines, Washington, D. C. Information Circular 6,194; 6 pp.

Physiological Factors of Mine Ventilation, by R. R. Sayers. Bureau of Mines, Washington, D. C. Information Circular 6,196; 17 pp.

Permissible Storage-Battery Locomotives and Power Trucks, by L. C. Ilsley, E. J. Gleim and H. B. Brunot. Bureau of Mines, Washington, D. C. Bulletin 313; 120 pp., illustrated; price, 45c.

Method and Cost of Mining the Pittsburgh, or No. 8, Coal Bed in Four Eastern Ohio Mines, by J. W. Paul and H. Tomlinson. Bureau of Mines, Washington, D. C. Information Circular 6,208; 21 pp., illustrated.

Recent Patents

Valveless Rock Drill; 1,748,953. Louis W. Greve, Cleveland, Ohio, assignor to Cleveland Rock Drill Co., Cleveland, Ohio. March 4, 1930.

Mining Machine; 1,749,069. Edward J. Doberstein, Blue Island, Ill., assignor to Goodman Mfg. Co., Chicago, Ill. March 4, 1930.

Coal-Washing Apparatus; 1,749,350. James A. McQuail, Hiawatha, W. Va., assignor to Jeffrey Mfg. Co., Columbus, Ohio. March 4, 1930.

Differential Helical Chute; 1,750,081. Robert F. Wood and Ernest A. Heckler, Glenside, Pa. March 11, 1930.

Method and Apparatus for Separating Materials of Different Specific Gravities; 1,750,090. Thomas M. Chance, Merion Borough, Pa., and Harry O. Staples, Scranton, Pa. March 11, 1930.

Loading Machinery; 1,750,876. John L. Clarkson, Nashville, Ill. March 18, 1930.

Coal Breaker; 1,750,941. Frank Pardee, Hazleton, Pa. March 18, 1930.

Pulverizing Machine; 1,751,009. William K. Liggett, Columbus, Ohio, assignor to Jeffrey Mfg. Co., Columbus, Ohio. March 18, 1930.

Blasting Explosive; 1,751,436. Frank H. Bergeim, Woodbury, N. J., assignor to E. I. duPont de Nemours & Co., Wilmington, Del. March 18, 1930.

Apparatus for Pulverizing Coal or Other Fuel; 1,751,525. John Mullin, Enfield, England. March 25, 1930.

Blasting Apparatus; 1,751,659. George S. Rice, Washington, D. C. March 28, 1930.

Mining Prop; 1,752,101. Heinrich Meutsch, Essen, Germany. March 25, 1930.

Retort for the Distillation of Coal and Other Solid Carbonaceous Substances; 1,754,693. Charles H. Parker, Codsall, England, assignor to Low-Temperature Carbonisation, Ltd. London, England. April 15, 1930.

Coking Coal; 1,754,765. Samuel W. Parr and Thomas E. Layng, Urbana, Ill., assignors to Urbana Coke Corporation, Urbana, Ill. April 15, 1930.

Priming Means for Centrifugal Pumps; 1,755,000. Otto Haentjens, Hazelton, Pa. April 15, 1930.

Coal-Loading Device; 1,752,453. James A. O'Neil, Hanna, Wyo. April 1, 1930.

Loading Machine; 1,752,714. Albert C. Wilcox, Bridgeport, Ohio. April 1, 1930.

Coal-Briquet Machine; 1,752,644. Henry G. Layng, deceased, Chicago; Rosa A. Layng, executrix, Brooklyn, N. Y. April 1, 1930.

pings and overcasts are free from leakage. He sees that the haulage units are in good condition and gives the mine cars periodic inspection to determine those that are defective. He knows before the day's work has begun what tonnage to expect, and lays his plans accordingly. He holds a tight rein on supplies and materials, knowing full well that waste reflects back on management and increases production cost. At the close of the day he carefully examines the weigh sheets and notes the miners who have not loaded their maximum output. After determining the reasons for the shortcomings he remedies them. The men under his charge soon respect him as their superior.

The mine foreman should be complete master of the details of mining. If he is not, why employ him? If employed and found wanting, why retain him? He should from the outset be a finished product. The Old Man would not threaten to take matters in his own hands after the reading of a report, if his foreman is competent.

A. E. THOMAS.

Hagerstown, Md.

Cut Down Your Production When Good Men Are Scarce

WE NEED real miners, not tramps, for our mines. Not only does the tramp miner contribute to large-scale labor turnover but he causes you a lot of trouble in the working places, and in the town. Usually, he is not a good workman and his shortcomings can be noted in the condition of his place and in the poor quality of the product which he turns out. When he takes a job he intends to stay no longer than a week or two, and then skip out again. He has absolutely no conscience when it comes to loading out refuse with the coal. Almost invariably, he leaves behind him conditions that can be corrected only by adding to the mine cost and also cancelled orders. As likely as not, the tramp will take French leave, owing bills to the boarding house lady and others.

My experience as a foreman has taught me not to hire them in the first place, or to watch them mighty closely in case I find it necessary to give them work. Should you hire one unexpectedly, it is well to let him go at your earliest convenience. Otherwise you will find, as Mac points out, that he will cause good men and their families to leave the town in disgust.

I try always to be honest and fair in my dealings; good men appreciate fair treatment and will repay many times over the courtesy you extend to them. In the case of newcomers, I assign them to vacant working places, which usually are not the best, with the assurance that if they prove their ability and like their surroundings I will take care of them in the matter of working conditions. Under all circumstances, hold on to your old men at any reasonable cost. Tonnage should be curtailed when men are scarce in proportion to the number of good workers available. S. J. HALL.

Stickney, W. Va.

Working Knowledge Needed More Than "Blue" Vocabulary

TOO MUCH STRESS cannot be laid on the practical side of a foreman's education and training. Any boss who does not understand the machinery with which he is working is laboring under a serious handicap, because of his inability to give clearly defined instructions to his workmen. Theoretical training for the boss is of course a necessary requirement, but without practical training or experience in operating or handling a machine, he cannot thoroughly understand it.

The present trend of coal mining toward greater mechanization will entirely change the training requirements of bosses. Let us look back 40 years to when the old hay-burning locomotive was used to haul coal to the tipple and when mining was done by hand-pick. In those days the chief assets of a boss were a good sized vocabulary of choice "cuss" words and ability to handle them in such a way as to accelerate the speed of man or mule. Observation has taught us that something else is required to operate our present-day mines successfully. With machines to mine and load our coal and motors to haul it to the tipple, we find that old methods cannot be successfully applied to a machine. A mechanical knowledge must be had to produce the required results.

Every boss on the job should be required to aid in setting up any new type of machine allotted to his district. In so doing he will gain knowledge which, most likely, he never could acquire in any other way. The institution of a theoretical course in mining and a practical course at the scene of mining activities is a combination of training that should and will produce efficient bosses for our modern mines.

Hooversville, Pa. J. H. TIPTON.

Ask the Manufacturer's Aid In the Training of Operatives

ONE IDEA that might be followed in the training of foremen would be to ask the makers of all coal-getting machines in use if they would instruct and train certain recommended men on the operation and maintenance of the equipment at the factory. Perhaps the maker would be willing to send a representative to the mine for such a purpose. Visits to other mines and a study of technical literature have great educational and practical value. I don't think a theoretical course would be of much use, as the problems encountered at the plant are nearly all practical.

W. E. WARNER.

London, England

Trade Literature

Nuveyor Pneumatic Ash Conveyor. United Conveyor Corporation, Chicago. Folder containing operating data and describing applications of this conveyor.

The following are recent bulletins of the General Electric Co., Schenectady, N. Y.: Fabroil Gears, GEA-1236; Centrifugal Compressors—Geared Units, GEA-588C; Automatic Welding Head and Control, GEA-556C; Type RKS Capacitor Motors, GEA-1202; Textolite Gears, GEA-1242; Strip Heaters, GEA-1157A; CR1026 Enclosed Starting Rheostats for Repulsion-Induction Motors, GEA-1247; Solid-Shaft, Vertical Induction Motors, GEA-1117. These are all in folder form and illustrated.

"Distributors" for Rock Dusting Mines. American Mine Door Co., Canton, Ohio. Pp. 16, illustrated. Describes their application and operation; specifications also are included.

The Lincoln Greasing System for Mine Cars. Lincoln Steel & Forge Co., St. Louis, Mo. Catalog No. 29; 8 pp., illustrated. Covers electric greasing machine, standard grease plugs, coupler type grease plugs, control valve and hand-operated greasing cabinet.

Centrifugal Pump Accessories. Barrett, Haentjens & Co., Hazleton, Pa. This consists of a series of bulletins under one cover, the subjects of which are: Pump priming; submerged pumps; use of foot valves, air, steam and water ejectors; hand-operated priming pumps; motor-driven priming pumps; arrangement of intake piping.

Jet Condensers. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Leaflet 20,435; 4-pp. folder illustrating and describing their distinctive features, application and construction.

Extension Rails for Temporary Tracks. Truscon Steel Co., Cleveland, Ohio.

Caldwell Elevator Drive; H. W. Caldwell & Son Co., Chicago; Book No. 1086; 23 pp., illustrated. Describes the construction and advantages of this drive for bucket elevators of the centrifugal discharge, perfect discharge, or continuous bucket types.

"What 'Pittsburg' Is Doing to Modernize Mining" is the title of a 39-pp. illustrated bulletin issued by the Pittsburg Boiler & Machine Co., Pittsburg, Kan.

National Carbide V. G. Light, V. G. Handy Light and Carbide Lanterns are illustrated and described in a booklet of 17 pp., issued by the National Carbide Sales Corporation, New York City.

The Economy of Soft Water; Elgin Softener Corporation, Elgin, Ill.; Bulletin No. 120; 16 pp., illustrated. Discusses the advantages of soft water and the problems of rust, scale, corrosion, etc.

The Painting of Galvanized Iron and Other Zinc Surfaces; New Jersey Zinc Co., New York City; pp. 20, illustrated.

Electric Equipment for Handling Heavy Material; General Electric Co., Schenectady, N. Y.; GEA-1232; 24 pp., illustrated. All equipment for the loading and unloading of coal, including conveyors, coal towers, etc. are described.

The Importance of Straight Cut Ribs for Efficient Blasting of Coal, by F. T. Luscher; *Explosives Service Bulletin*, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; 4-pp. folder, illustrated.

Solving Power Factor Problems by Scale is the title of publication GET-191 issued by the General Electric Co., Schenectady, N. Y. A graphic method involving simple computations only.

Constant Weight Feeder. Hardinge Co., York, Pa. Bulletin No. 33; 4 pp. folder illustrating and describing the principle of operation and the applications of this device.

CO_2 Meters (Electrical), Bulletin No. 781, 24 pp.; The Homo Method Applied to Nitriding of Steel, Bulletin No. 950, 12 pp.; Galvanometers, Catalog No. 20, 40 pp.; are recent publications of the Leeds & Northrup Co., Philadelphia, Pa. The bulletins are illustrated.

OPERATING IDEAS

From PRODUCTION, ELECTRICAL

And MECHANICAL MEN

Interchangeable Right and Left Frogs Developed for Portable Turnouts

SIMPLIFICATION and more efficient design of materials for temporary tracks might be classed as a hobby of A. R. Long, superintendent of Scarbro mine, the New River Co., Scarbro, W. Va. The accompanying photographs show a ride-over frog and guard rail which were made according to his specifications.

The frog is used as a "right" or "left" for open-end sidings, passing sidings, temporary turnouts, room switches, and for switches into both entry and room breakthroughs; in fact, it is used for all short-radius turnouts.

Fig. 1 shows both frog and guard rail being installed as a "left" room switch. *A* is a wedge, hollow on the under-side to reduce weight, which will be driven in the direction it is pointing to lock the frog in place. Teeth *B* engage similar teeth on the bottom of the wedge to hold it from working out. Projection *C* on the frog goes over the base of the main track rail, which is not disturbed. *D* is a chair on which the end of the rail rests.

The guard rail consists of a short length of rail bent at the ends, and riveted to a plate which also mounts two rotary clips. On one side the rail flange is cut at two places and the length between *E*, bent up to fit over the flange of the rail to which the guard is fastened with the clips. Fig. 2, photographed from the same point as Fig. 1, shows the frog and guard rail installed.

The complete turnout is shown in Fig. 3, a photograph looking inby on a room entry. In this case standard switch points are used, because the joint *F* of the main rail was located at the right point so that it could be opened. All but two of the steel ties used with this turnout are standard. The throw tie, *G*, is a 1½-x6-in. channel section. The tie *H*, located at the heel of the point rails, is fitted to clamp the four rails.

Fig. 4 shows the track to the face of a room and to a breakthrough in the right-hand pillar. Here the same turnout parts are used, except that ride-over points are substituted for the standard switch points. These points have the advantage that neither rail of the main track is disturbed, but have the disadvantages of more difficult manufacture and the sudden elevation of the wheels as they pass over. Spring switch throws are not used with the ride-over points, because it was found that with that arrangement a hard pull out of a room would throw the points and cause derailment.

The use of a temporary turnout, such as is shown in Fig. 4, that does not disturb the main rails, makes it practicable to provide two working places per room instead of one. Without such an arrangement the usual method is to turn the main track for driving the breakthrough and temporarily stop advance of the room while the breakthrough is being driven.

Fig. 1—Ready to Slide the Guard Rail Into Position and Drive the Frog Wedge

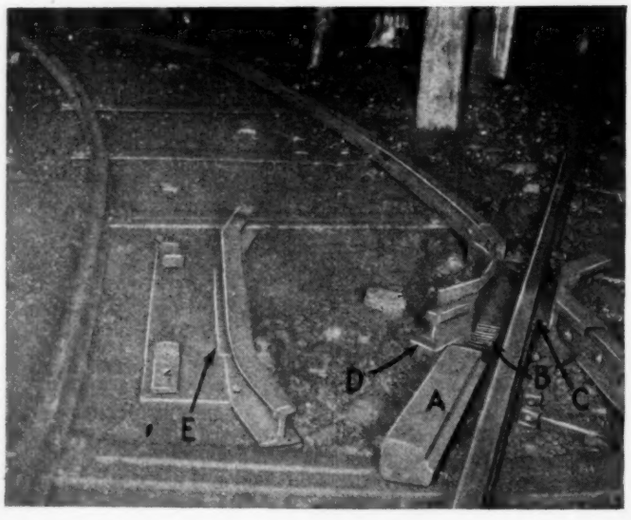
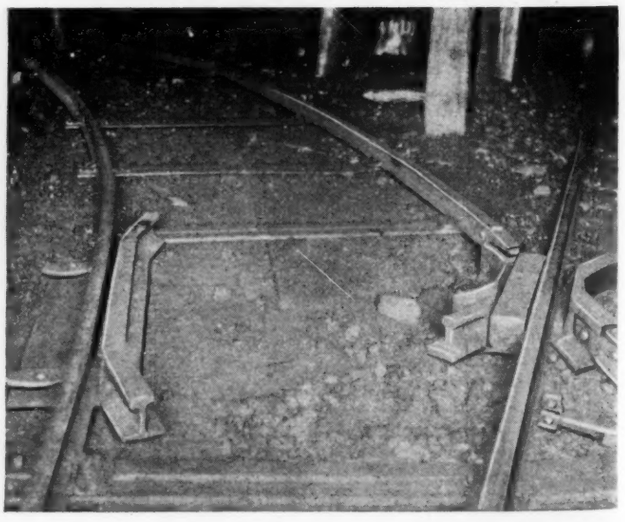


Fig. 2—Showing the Guard Rail and Ride-Over Frog in Working Position



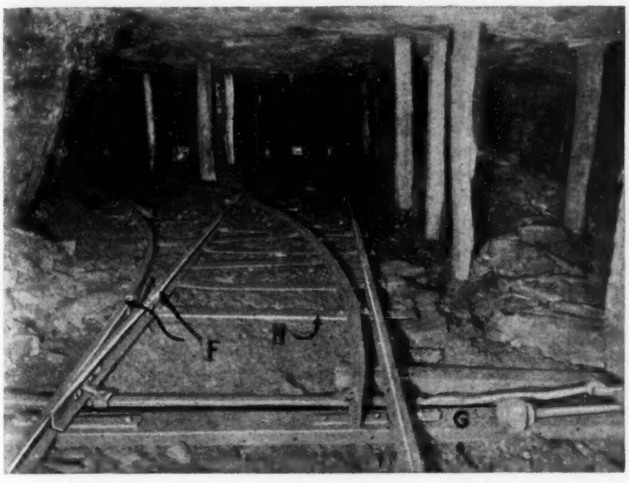


Fig. 3—Portable Turnout as a Left-Hand Room Switch and Using Standard Switch Points

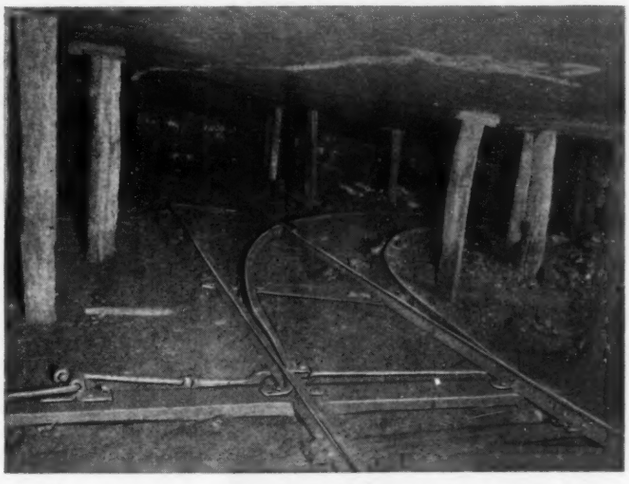


Fig. 4—Portable Turnout as a Left-Hand Switch to a Room Breakthrough and Using Ride-Over Points

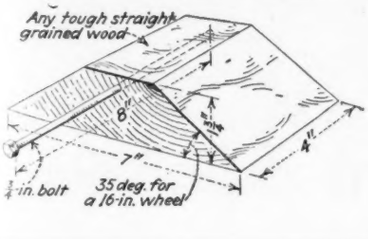
Mr. Long now has one entire section of the Scarbro mine on steel ties and equipped with the portable switches and with extension rail ties. In this section, where there are 34 loaders, but one track man is employed. He lays all switches and the loaders extend the room tracks. Applications have been made for patents covering the frog and guard rail.

An All-Service Chock Block Without Frills

"In the December, 1929, issue of *Coal Age*," writes Thomas James, superintendent of No. 3 mine, Knox Consolidated Coal Co., Bicknell, Ind., "I saw an operating idea describing the John Hayes chock block for mine use. On a two-track bottom the John Hayes block requires the provision of rights and lefts. For 12 years we have been using a block of a type which, I think, has superior characteristics, most notably in that it is of simpler design and serves equally well whether it is applied to the wheel on one track rail or on the other."

This block is so simple that an unskilled laborer can be employed to make it from a templet. As shown in the accompanying sketch, the block, which is made from common room ties, takes a ¾x8-in. bolt. The first outlay for the bolts also is the last, for they can be used over and over again. An important factor in the design of this block is that the slope of the wedge must be made in keeping with the diameter of the mine car wheel. This slope should be 35 deg. for a 16-in. wheel. The handle bolt is driven into a hole made in the block.

Perspective View of Block



If one of these blocks is placed under each of the two wheels on one side of each of the first four cars, a trip of 30 3-ton cars moving six to eight miles an hour on a 2-per cent grade, can be stopped in four car lengths. At the Knox No. 3 mine, one man has stopped two trips (on parallel tracks) simultaneously, using this type of block. Having stopped the trip, he has started the cars rolling and dropped one at a time to the cager, without actually stopping the trip again.

Achievement Vs. Reward

Values of achievement and actual rewards are seldom in direct proportion. In the work-a-day world today a man who is but slightly more capable towers above his near associates. Small increments of superiority pyramid monetary compensations. Mastery of the solutions of electrical, mechanical, and mining problems suggested in these pages will give you "the edge" which will lift you above the level of your present job. In the course of your rise you should give the other fellow a hand by giving him the benefit of your experience. Send in your ideas, accompanied by photographs or sketches. If published, they will be paid for at a minimum rate of $5 each.

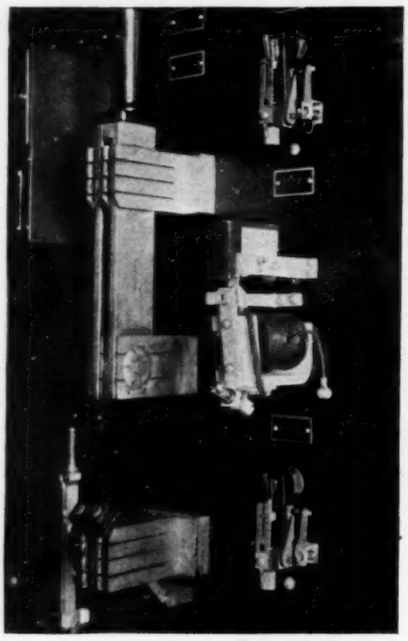
Extra Relay Provides Light-Load Protection

Circuit breakers on d.c. mine feeders should have a light-load range for the overload trip, so that during nights or periods when the mine is not operating, the current flow can be limited to the smaller value required during that period. In many instances monthly power bills have been increased 10 to 40 per cent and a fire hazard created by a short-circuit happening at night at some remote point in the mine where the resistance was just sufficient to limit the current below the setting of the overload relay. Two overload relays, one operating instantaneously and the other after a definite time, answer the requirement to a certain extent but not so completely as two instantaneous overload relays with entirely different ranges.

The latter arrangement was applied to an automatic reclosing panel recently added to an outside substation of the New River Co.'s Cranberry No. 3 mine, Sprague, W. Va. In this case, however, the principal reason was for protection to the reduced generating capacity operated in the substation at night. The reclosing panel is in circuit with the single feeder from the substation.

This station, containing five 150-kw. synchronous motor-generators, was built before satisfactory switching equipment of the full-automatic type was available. It is located in a remote section about 1½ miles from the tipple, and a house was erected near by for an attendant. For several years two attendants were employed, one on duty in the day time and the other at night. Instead of converting the substation to full-automatic it was considered a better proposition to add the reclosing feeder panel and thus dispense with the night attendant only.

At night but three of the five units are left in operation. The accompanying photograph shows a part of the new automatic feeder panel. For night operation, the heavy single-pole double-throw knife switch is changed to the bottom



Double-Throw to Utilize Either Relay

contact, which is shown protected by a movable insulated bumper block. With the switch blade in that position an overload relay rated 300 to 700 amp. is placed in circuit, and the day relay rated 750 to 1,500 amp. is taken out of circuit. The upper and lower relays, of similar construction and mounted at the right of the double-throw switch, are those involved. On the back of the board a main conductor from each switch clip passes through a magnetic yoke which is a part of the respective overload relay.

A circuit is arranged to give an alarm at the operative's home at night in case the feeder breaker locks out. When the operative leaves the substation at the end of the day, he stops two of the motor-generators, throws the heavy knife switch to the lower clip, and closes the alarm circuit.

Locate Openings Far Apart To Avoid Recirculation

Importance of locating intake and return air portals many hundred feet apart at a gassy mine is indicated by tests conducted recently at an operating mine where the exhaust fan is but 150 ft. from the intake. These openings are at the same elevation and are located on a mountainside approximately 50 ft. above a creek bed.

Analyses of air samples from the main return and the splits are made regularly at this mine. At times the main return was found to contain as much as 1 per cent methane. Analysis of the condition led to the discovery that the so-called "fresh air" sometimes contained considerable methane, and finally samples taken from just inside the portal of the intake airway disclosed as high as 0.52 per cent methane in the air being drawn into the mine when the fan, 150 ft. distant, was exhausting air containing 1 per cent.

It is not at all unusual to find the intake air containing 0.15 to 0.3 per cent methane. The quantity varies with barometic pressure, temperature, and direction of wind. On a still day, under certain conditions, the air exhausted from the mine seems to form a huge cone around the place and some of the air from this cone is pulled back into the mine. In view of what has been disclosed by actual tests, it is conceivable that for short times, with just the right conditions and a favorable direction of wind or sluggish air current, return air with practically no dilution could be drawn back into the mine.

Ten Years' Service Proves Cast-Steel Wheels

More than ten years ago—July, 1920, to be exact—the Gauley Mountain Coal Co., Ansted, W. Va., put into use on a mine car one set of cast-steel wheels. Since that time several other purchases of wheels of this material have been made, and at present 195 sets are in use in the mine. Not until just recently did the first set have to be removed from service. Without developing flat spots it had worn until the tread next to the flange was less than ☆ in. in thickness. On both wheels of one truck cracks developed around thin sections but caused no trouble before removal. This truck is shown in Fig. 1.

R. H. Morris, general manager, firmly

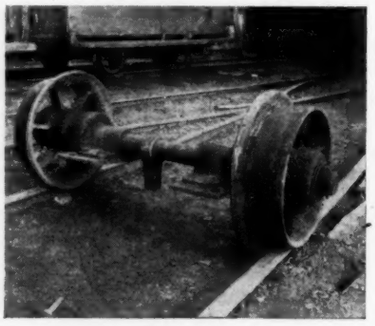


Fig. 1—Delivered Practically Ten Years of Continuous Service. The Wear Was Uniform and Without Flat Spots

believes in the cast-steel wheel for mine car service, but finds difficulty in purchasing new cars so equipped. He regrets the apparent lack of interest the mine car manufacturers display when asked to quote on cars with this type wheel. In the case of the cast-steel wheels now used at Ansted, the trucks were purchased and put under cars rebuilt or assembled at the company shop. The trucks have been purchased from three manufacturers, one in Alabama, a second in Iowa, and the third in England.

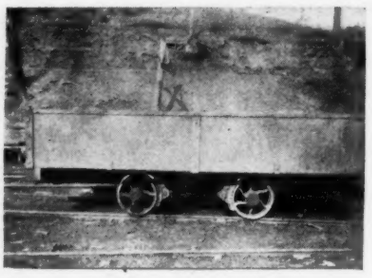


Fig. 2—The Company Uses 110 Sets of Cast-Steel Wheels of This One Type

Mr. Morris cautions regarding a point of design in cast-steel wheels. Because the material is not brittle there may be a tendency on the part of the designer to use too few spokes or to make the tread and flange section so light that the tread may bend between spokes if the service is exceptionally hard. Six spokes seems to be the practical minimum.

Fig. 2 shows one of the steel-wheel-equipped cars. Of this particular type, which is fitted with Timken bearings, the Gauley Mountain Coal Co. has 110 sets in use.

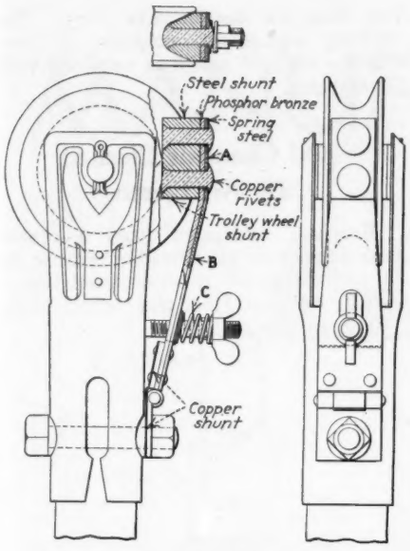
It seems to be a characteristic of the steel wheel that a slight flat spot developed by sliding appears to iron itself out instead of progressively getting worse.

Shunt Device Adds Life To Trolley Wheels

Where 400 to 700 amp. are drawn through the trolley of a mine locomotive for any considerable period of time, the resistance to the flow of this heavy current may generate more heat in the trolley wheel than this part can stand. Heat so developed is frequently the cause of early destruction or deterioration of the wheel. Under the severest of these conditions. a trolley wheel may last no longer than one 8-hour shift, according to Fred Allen, electrician, Mt. Olive & Staunton Coal Co., Staunton, Ill.

The electrical department of this company has developed a device for shunting the current from the trolley wheel to the lead-in cable terminal. The method is said greatly to relieve the overload on the wheel, axle, contact springs, and washers in the trolley collector.

This device (see sketch) consists of a small contactor, *A*, which is mounted on the end of a hinged arm, *B*, and held in the groove of the trolley wheel by compression of the coil spring *C*. A strip of spring steel laminated with a strip of phosphor bronze forms the contactor arm. The hinge is placed near the ball that holds the cable terminal



Details of Trolley-Wheel Shunt for Use on Large Locomotives

and harp to the pole. Current is passed around this hinge through a thin, flexible strip of copper.

At the No. 2 mine of this company this shunt has prolonged the life of a trolley wheel to an average of one month. One 16-ton locomotive and one tandem unit made up of two 10-ton locomotives are equipped with it. The saving realized has amounted to about $40 per month.

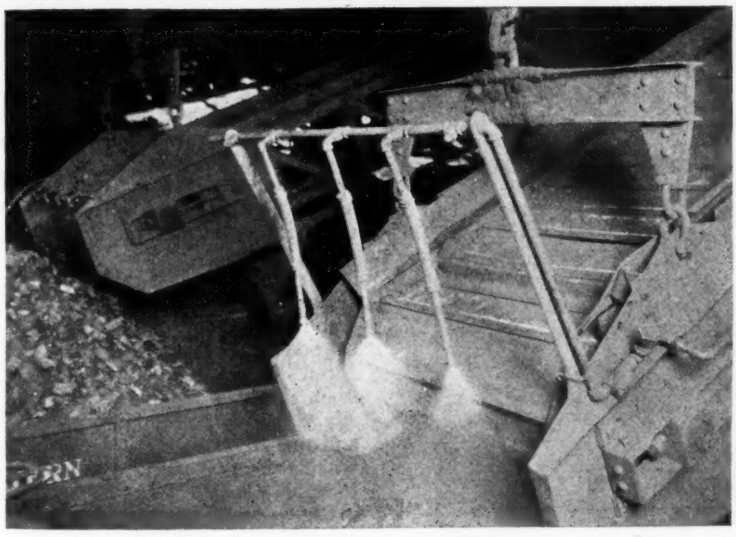
Flexible Mountings Best For "Dustless" Spray

Occasional lumps much larger than average size caused trouble by bending or breaking the calcium chloride nozzle pipes on the lump loading boom at Keystone tipple of the Houston Collieries Co., Keystone, W. Va. The obvious solution was to shorten the pipes, but this would place the nozzles higher than is good practice.

The accompanying photograph shows a more satisfactory solution, suggested by a tipple employee. The pipes were cut in the center and short sections of heavy rubber hose were interposed between. The flexibility provided allows a nozzle position which is best for average conditions.

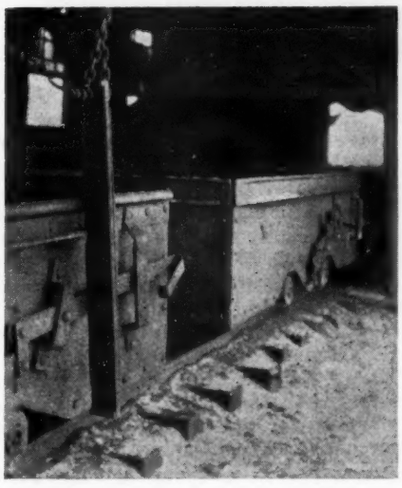
Only the coal loaded into those cars constituting special orders for "dustless coal" are sprayed with the solution.

Nozzles Are Close, but a Large Lump Will Not Break the Pipes



Bar Releases Brakes by Bumping Handles

Brakes on the 4-ton steel cars at the Keystone mine of the Koppers interests, in McDowell County, W. Va., are of such a design that the handle becomes set a few notches, due to the car being given a complete revolution in the rotary dump. This makes it necessary for a man to release the brake on each car after it passed through the dump, for without this precaution the car feeder, which handles a full trip through the dump without uncoupling, would become overloaded.



Position of Bar When Trip Is Stopped During the Dumping of a Car

To eliminate this labor C. A. Warden, superintendent, experimented with the simple expedient of hanging a heavy iron bar where it would bump the brake handles as the cars went by. With a few adjustments of position and the addition of a side chain to keep the bar from swinging too far away from the car, it was found that the bar released more than 90 per cent of the brakes. Since action of the dump sets the brakes but lightly, the few cars on which the bar fails to release the brakes have no appreciable effect on the feeder.

The experimental device worked so well that it has been adopted as a permanent arrangement. The bar hits the brake handle on a return swing caused by sliding over the notch-bar support. Now it is no longer necessary to have a man release brakes on the empty side of the dump.

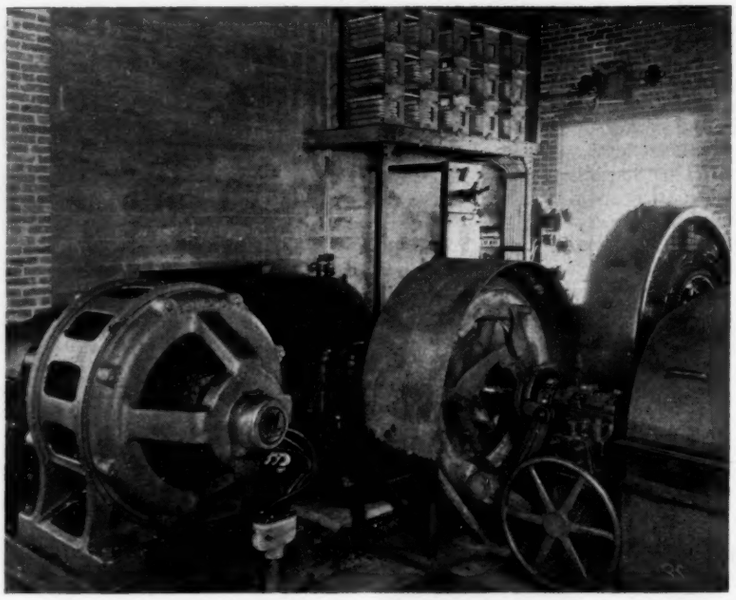
Open Secondary Lead Saves $100 Per Month

During 1929, *Coal Age* columns referred twice to operation of slipring induction motors with one wire of the three-phase secondary opened for obtaining a reduced speed without use of resistance or without adding extra resistance (page 181, March issue, and page 765, December issue). This method is said to be saving approximately $100 per month in power cost of operating the mine fan at the new Wildwood plant of the Butler Consolidated Coal Co., Wildwood, Pa.

The control of the 200-hp. motor is equipped with resistance of sufficient capacity to permit operation on "points" and also with a single pole manually operated switch in one lead to the motor secondary. The fan has a rating of 300,000 cu.ft. at 3 in. water gage, but at the present state of mine development only 125,000 cu.ft. per minute is required. A pressure of 1 in. water gage is inherent for delivering this quantity.

At this reduced speed, only about 26 b.hp. is required. The motor is operated with the secondary switch open and on first controller point, leaving full resistance in the one operating phase of the secondary. The mine will develop rapidly, necessitating frequent increases of speed, but the open-lead secondary method can be used up to the limit where the last point on the controller will not produce the required speed. At this stage all three phases of the secondary will have to be put into use and the controller again operated on "points."

The saving of $100 per month is computed as compared to operating with



But One Phase of the Motor Secondary Is in Use

the three phases in circuit and with sufficient added resistance to reduce the motor speed to the same point. The method, so far as power saving is concerned, is applicable only in cases where the motor load at the reduced speed is a small per cent of rated full load.

Car Shifting Handled by Battery Locomotive

In addition to hauling coal there may be several other transportation jobs about a mine which can be handled to advantage with a battery locomotive. Most of these are inside of the mine, but the outside also presents opportunities for this type of locomotive. At a mine of the Peerless Coal & Coke Co., Vivian, W. Va., a 10-ton battery locomotive, employed to shift empty railroad cars, has won unqualified approval of the mine officials. W. G. Williamson, superintendent, believes this type of power is ideally suited to the duty.

The approval is based on long battery life, exceptional ability to handle several cars at a time upgrade and freedom from breakdown. The locomotive was installed May 14, 1925, and the original battery, a 25-plate 44-cell lead type, was still sufficiently active at this writing to meet the job.

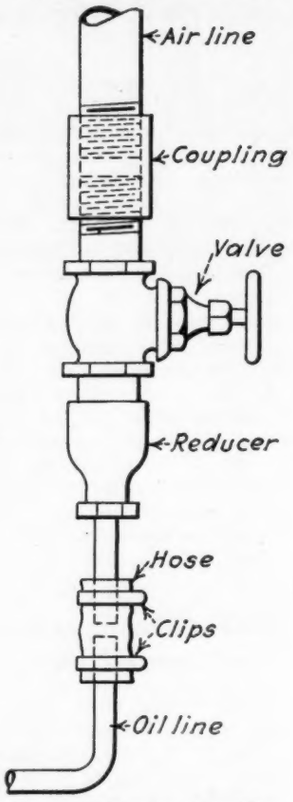
The specification called for a locomotive that would handle sixty 115,000-lb.-capacity railroad cars to the tipple from a maximum distance of 2,500 ft. in an elapsed time of 6½ hours. The grade averages about 1½ per cent and there is a curve near the tipple. The machine purchased, which showed a rated full-load speed of 3½ m.p.h., regularly pulls five cars at a time. In summer longer trips than this often are pulled, but during severe winter weather two or three cars may be the maximum that can be pulled around the curve.

According to T. A. Martin, chief electrician, this locomotive has performed exceptionally well from the standpoint of reliability. In the span of nearly five years, it has been inoperative a total of but four hours because of mechanical or electrical difficulties, and the repair part expense has been an insignificant item. The driving equipment consists of two motors, each of which is rated 80 volts 90 amperes.

Here the Locomotive Is Shifting a Loaded Car

Oil Channels Cleaned By Air Ejector

Bearings lubricated from a central tank sometimes give trouble because the oil feed is cut off by an accumulation of dirt or by some other obstruction in the line. A speedy remedy for this condition is provided through the use of compressed air as a cleaning agent, writes W. E. Warner, Brighton, England.



Prevents Bearing Trouble

A convenient method of doing this job is illustrated in the accompanying sketch. The fitting used is provided with a coupling for attachment to the air line at the one end and with a short length of hose and tightening clips at the other end. Between the ends of this fitting are a valve and a reducer which terminates in a diameter approximately that of the oil line.

Another use for this fitting is the cleaning out of lubricating oil wells. Its use is preferable for this job to the method of swabbing out with kerosene. First, the well is filled partly with kerosene, then the small end is submerged slightly below the surface of this liquid and the air is turned on. Thus the oil will be violently agitated and the débris loosened from all corners and crevices in the well and afterward may be drained off with the kerosene.

AMONG THE MANUFACTURERS

CUTLER-HAMMER, INC., Milwaukee, Wis., has purchased the assets of the Union Electric Mfg. Co., Milwaukee, Wis., specializing in drum-type controller apparatus. The present Union factory will be operated as a manufacturing division of Cutler-Hammer. E. F. LENOIR, president of the Union company, joined the headquarters sales staff of Cutler-Hammer.

* * *

WAGNER ELECTRIC CORPORATION, St. Louis, Mo., has appointed Albert Shaw mining engineer to its branch office sales force at Salt Lake City, Utah.

* * *

WITH THE COMPLETION of the new Carbide & Carbon Building, Kansas City, Mo., the following units of the company will have their headquarters there: Linde Air Products Co.; Prest-O-Lite Co., Inc; Oxweld Acetylene Co.; Union Carbide Sales Co.; J. B. Colt Co.; and National Carbon Co., Inc.

* * *

W. S. RUGG, vice-president in charge of engineering, also has been placed in charge of the sales activities of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., vice Edward D. Kilburn, resigned. S. M. KINTNER, director of the Westinghouse research laboratory, has been made assistant vice-president and assumes charge of the engineering department under Mr. Rugg.

* * *

MANUFACTURING DIVISION of H. D. Conkey & Co., Mendota, Ill., has been changed to the Conco Crane & Engineering Works division of H. D. Conkey & Co.

* * *

T. A. MARSH has been made president of the Modern Coal Burner Co., Chicago, a subsidiary of the Peabody Coal Co. New headquarters of the company are 3733 Lincoln Ave., Chicago.

* * *

LINK-BELT CO., Chicago, has removed its Baltimore (Md.) office to 913 Lexington Building.

* * *

ELLIOTT CO., Jeanette, Pa., has removed its New York City office to 225 Broadway, and its Chicago office to 20 North Wacker Drive.

SOUTHERN MANGANESE STEEL CO., a subsidiary of the American Manganese Steel Co., Chicago Heights, Ill., has been taken into the latter organization as the Southern Manganese Steel Division. New sales offices have been opened in the Law & Finance Building, Pittsburgh, Pa., under the direction of W. G. HOFFMAN. The American Manganese company also has appointed JOHN H. COGHLIN New England representative, vice Harrington, Robinson & Co., South Boston, Mass. Mr. Coghlin's headquarters will be at Cambridge, Mass.

* * *

NEGOTIATIONS have been concluded whereby the American Rolling Mill Co., Middletown, Ohio, will add the Blue annealed sheet facilities of the Sheffield Steel Corporation, East Kansas City, Mo., to its production program. When arrangements are completed, the combined companies will have plants at Middletown, Zanesville, and Columbus, Ohio; Ashland, Ky.; Butler, Pa.; Kansas City, Mo.; and Oklahoma City, Okla.

* * *

CHAIN BELT CO., Milwaukee, Wis., has appointed the following distributors: construction equipment division—R. B. Everett Co., Houston, Texas, and J. D. Adams Mfg. Co., Indianapolis, Ind.; chain and transmission equipment—Corbin Supply Co., Macon, Ga. The company also has removed its New York City office to 405 Lexington Ave.

* * *

J. B. GILLHAM and G. A. ANDERSON have been sent to the Los Angeles (Calif.) and San Francisco (Calif.) offices, respectively, of the Utilities Equipment Corporation, the Pacific Coast sales representative of the Reliance Electric & Engineering Co., Cleveland, Ohio.

* * *

HAROLD F. KNEEN, assistant plant superintendent of the Cleveland (Ohio) plant of the Lincoln Electric Co., has been promoted to the position of superintendent. The Lincoln company also has removed its Baltimore (Md.) office to 600 North Calvert St., and appointed R. RUDE and C. N. HILBINGER as office manager and sales engineer, respectively.

GENERAL CABLE CORPORATION, New York City, has reorganized its field sales policy with the establishment of eighteen district and territorial sales offices, and the assignment of the entire district sales personnel of the Dudlo, Rome, Safety, and Standard underground divisions to the new territories. Identities of the thirteen companies comprising the four operating divisions will be continued as manufacturing and shipping units, and present trademarks will be retained. Newly-appointed district and territorial managers are: A. D. Stein, Boston, Mass.; O. G. Miller, and M. E. Damon, Rome, N. Y.; N. C. Osthoff, Buffalo, N. Y.; F. O. Hoyt, Philadelphia, Pa.; H. G. Richardson, Washington, D. C.; R. A. Gray, Pittsburgh, Pa.; K. D. Clothier, Cincinnati, Ohio; C. R. Evans, Cleveland, Ohio; E. W. Kearns, Chicago; F. B. Nimmo, Minneapolis, Minn.; H. C. Wilder and M. L. Tice, Birmingham, Ala.; J. A. Peacock, Atlanta, Ga.; W. D. Hampton, Charlotte, N. C.; A. Z. Barnes, Dallas, Texas; E. H. Shutt, St. Louis, Mo.; B. E. Dolch, Kansas City, Kan.; W. A. Craveson, Detroit, Mich.; R. G. Harriss, Denver, Colo.; C. G. Gauntlett and W. G. Stearns, San Francisco, Calif.; and C. A. Brown, Seattle, Wash. Divisional district managers function as before, with headquarters in New York City.

* * *

HARRY RHODEHOUSE has been made general traffic manager of the Republic Steel Corporation, Youngstown, Ohio, and W. H. Ohl has been made comptroller. Both held similar positions with the old Republic Iron & Steel Co. Executive sales appointments are: A. E. WALKER, former general sales manager of the Republic Iron & Steel Co., as assistant vice-president; J. M. Schlendorf, vice-president in charge of sales, Central Alloy Steel Co., sales manager; Norman Foy, Birmingham district manager, Republic Iron & Steel Co., sales manager, mild steel products, with headquarters at Youngstown, Ohio.

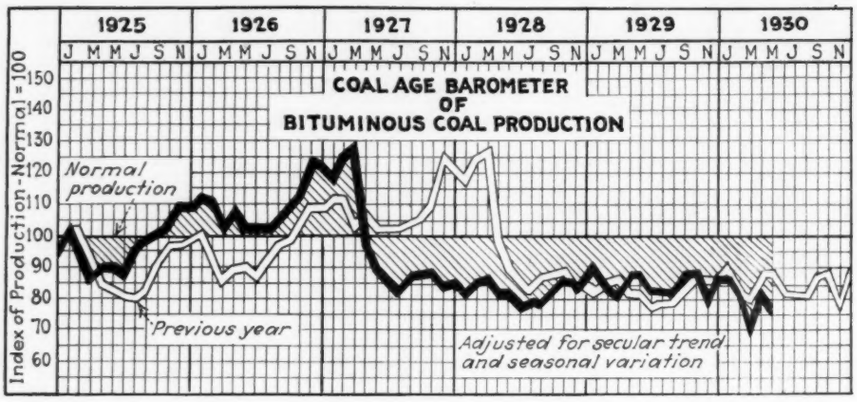
* * *

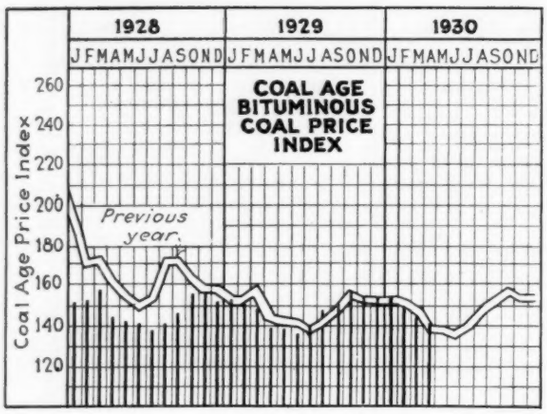
ALLIS-CHALMERS MFG. CO., Milwaukee, Wis., has removed its Chicago district office to 20 North Wacker Drive.

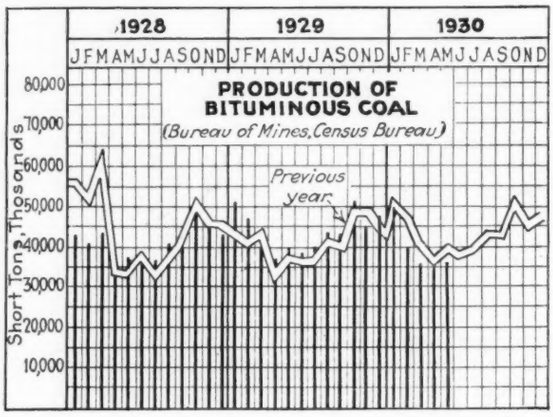
* * *

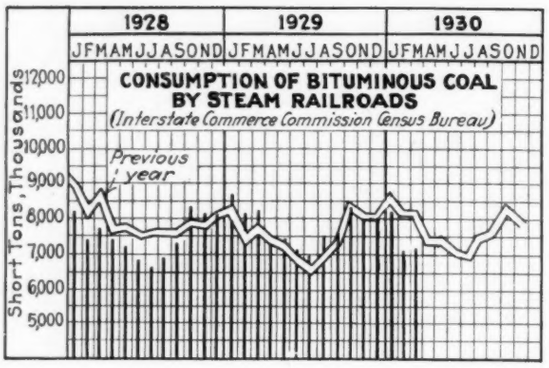
R. W. GILLESPIE, formerly vice-president and general manager of the Jeffrey Mfg. Co., Columbus, Ohio, has been elected president. ROBERT H. JEFFREY, president, was made chairman of the board. J. FRANK DAVIDSON, assistant general manager, was elected vice-president and assistant general manager.

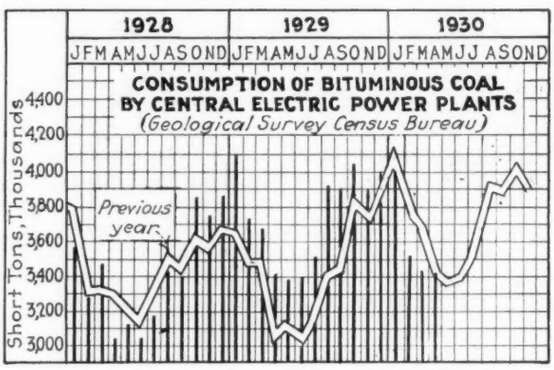
Indicators of Activities in the Coal Industry

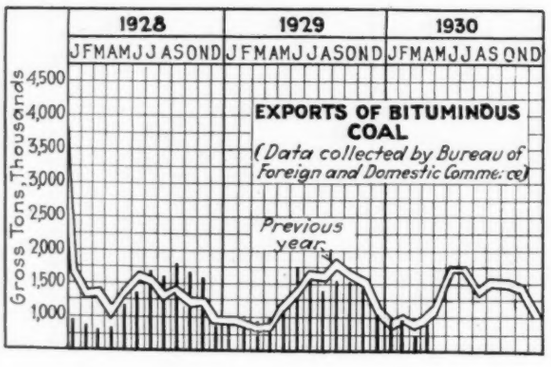


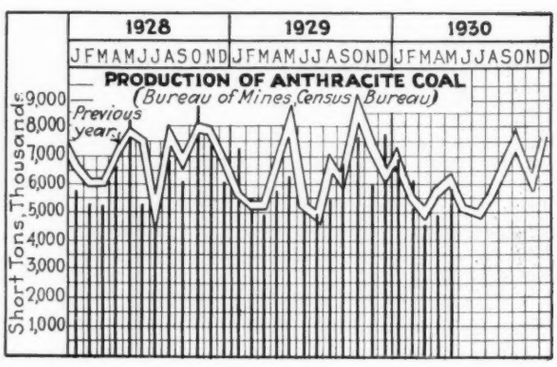












MARKETS in Review

THE bituminous coal markets of the country failed to get out of the doldrums during the month of May. Both domestic and industrial demand were light, though fairly steady on the whole. Buying for stockpiles presented a study of contrasts, with some sections reporting a well-defined tendency in that direction and others lamenting the total failure to interest customers. On the whole, stocking still tended to be less than in preceding years.

May production of bituminous coal is estimated by the U. S. Bureau of Mines at 35,884,000 net tons, an increase of 24,000 net tons over April and a decrease of 4,822,000 net tons from May, 1929. Anthracite production is estimated at 5,834,000 net tons for May. This compares with 4,916,000 net tons in April and 6,308,000 net tons in May, 1929. *Coal Age* Index of spot bituminous prices (preliminary) was: 138, May 3; 139, May 10; and 136, May 17, 24, and 31. The corresponding weighted average prices were: $1.67, May 3; $1.68, May 10; $1.65, May 17; and $1.64, May 24 and 31. The revised Index figures for April were: 141, April 5; 140, April 12; 142, April 19; and 140, April 26. Corresponding weighted average prices were: $1.71, April 5; $1.70, April 12; $1.72, April 19; and $1.69, April 26. The monthly Index for April was 140¾, as compared to the unrevised figure of 137 for May.

Cargo dumpings at the lower Lake ports continued in slightly smaller volume than last year. Total dumpings for the season to May 26 were 6,845,434 tons, which included 215,212 tons of bunker fuel. The total for the same period in 1929 was 7,190,657 tons. The week ended May 26 established a new record for weekly dumpings, with a total 1,492,593 tons.

Dullness pervaded the anthracite markets of the country until the last of May, when anticipation of price advances gave buying an impetus. Steam business was fairly uniform throughout the month. Discounts in the New York and Philadelphia markets and announcements of freight rebates in the Chicago market were outstanding developments in May.

INDUSTRIAL depression and poor credit conditions combined to throttle the Chicago coal trade in May. Public indifference was reflected in a lack of interest in prepared sizes on the part of the dealers, while steam coal users were content to rely on contract takings. Several industrial users reduced contract takings 25 to 30 per cent, with no immediate prospects of an increase. Domestic prices were easy on coal from all fields. Operators resorted to several methods of stimulating demand, which were, for the most part, unsuccessful. Eastern shippers of the better grades of bituminous coal sought business in some cases on a surety plan, described elsewhere in this issue. The amount of coal moved under the surety plan was small, however, as dealers refused to be obligated, on the ground that coal on hand might lead to carelessness in extending credit to the public.

Ordinary grades of Eastern high-volatile coals dragged in May, despite reports of higher prices. Quotations on block were around $2, with egg at $1.75 @$2. Some producers asked $2.25 on block and $2 on egg for future delivery. Premium coals were in much better position under the stimulus of a fair demand, with some companies slightly oversold on block, egg, and slack. Shipments to the Lakes by both high- and low-volatile producers were at a higher rate than ever before in May.

Smokeless mine-run was dull at $1.75 @$2. Transit shipments were at a minimum, producers realizing that consignment coal could neither be moved promptly nor at a price. Distress cars, both prepared sizes and mine-run, were dumped at ridiculous figures. Spot shipments of lump, stove, and small nut moved better than egg in most cases, though the slump in egg is thought to be only temporary.

SMALL takings on dealer contracts caused Illinois, Indiana and western Kentucky coals to limp badly in May. Southern Illinois operators advanced the prices on major sizes 15c. for June, in accordance with their regular program. Domestic movement from Illinois, Indiana and western Kentucky was practically at a standstill, with operators confining their attention to steam coal, which in itself was inactive. Screenings were scarce, yet no demand was discernible over the month. Prices, in most cases dictated by the buyer, were: Illinois and Indiana, 75c.; western Kentucky, 75c.@90c.

Dullness pervaded the St. Louis domestic market in April, though some slight signs of life were discernible at the last, when price reductions began to make themselves felt. Steam demand was steady over the month, and prices were firm.

Business continued in light volume over the month of May at the Head of the Lakes. May shipments from the docks decreased 4,000 cars to a total of

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.o.b. Mines

		Week Ended						
		May 3, 1930		May 10, 1930	May 17, 1930	May 24, 1930	May 31, 1930	
	Market Quoted	Independent	Company	Independent	Independent	Independent	Independent	Company
Broken	New York	.....	$8.00	.....	.....	.....	.....	$8.00
Broken	Philadelphia	.....	.....	.....	.....	.....	.....	.....
Egg	New York	$8.10	8.10	$8.00@$8.10	$7.85@$8.10	$7.85@$8.10	$7.85@$8.10	8.10
Egg	Philadelphia	8.10@ 8.35	8.10	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10
Egg	Chicago*	7.23	7.23	7.23	7.23	7.23	7.23	7.23
Stove	New York	8.60	8.60	8.50@ 8.60	8.35@ 8.60	8.35@ 8.60	8.35@ 8.60	8.60
Stove	Philadelphia	8.60@ 8.85	8.60	8.60@ 8.85	8.60@ 8.85	8.60@ 8.85	8.60@ 8.85	8.60
Stove	Chicago*	7.68	7.68	7.68	7.68	7.68	7.68	7.68
Chestnut	New York	8.10	8.10	8.00@ 8.10	7.85@ 8.10	7.85@ 8.10	7.85@ 8.10	8.10
Chestnut	Philadelphia	8.10@ 8.35	8.10	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10@ 8.35	8.10
Chestnut	Chicago*	7.23	7.23	7.23	7.23	7.23	7.23	7.23
Pea	New York	4.40	4.40	4.25@ 4.40	4.25@ 4.40	4.25@ 4.40	4.25@ 4.40	4.40
Pea	Philadelphia	4.40@ 4.65	4.40	4.40@ 4.65	4.40@ 4.65	4.40@ 4.65	4.40@ 4.65	4.40
Pea	Chicago*	3.93	3.93	3.93	3.93	3.93	3.93	3.93
Buckwheat	New York	3.00@ 3.25	3.00†	3.00	3.00	3.00	2.90@ 3.00	3.00
Buckwheat	Philadelphia	3.00@ 3.25	2.75	3.00@ 3.25	3.00@ 3.25	3.00@ 3.25	3.00@ 3.25	2.75
Rice	New York	1.60@ 2.00	2.00	1.60@ 2.00	1.60@ 1.85	1.60@ 1.85	1.50@ 1.75	2.00†
Rice	Philadelphia	2.00@ 2.10	2.00	2.00@ 2.10	2.00@ 2.10	2.00@ 2.10	2.00@ 2.10	2.00
Barley	New York	1.25@ 1.50	1.50	1.25@ 1.50	1.25@ 1.40	1.25@ 1.40	1.15@ 1.40	1.50
Barley	Philadelphia	1.50@ 1.60	1.50	1.50@ 1.60	1.50@ 1.60	1.50@ 1.60	1.50@ 1.60	1.50

*Net tons, f.o.b. mines. †Domestic buckwheat, $3.50 (D., L. & W.).

11,000, which is the figure forecast for June also. Industrial contracting was satisfactory, many dock officials reporting large tonnages at the full list prices. A good proportion of the municipal and public utility business also was reported to be booked. Buying, in general, was confined to immediate needs. Discounts of 65c. in June on Pocahontas and 25c. up to August on Eastern high-volatile coals were announced during the month.

LIST prices at the last of the month, to be standard until August, were: Pocahontas egg, $8.25; lump and egg, $8; stove, $7.75; mine-run, $5; slack, $4.35; Kentucky block, $6.65@$7.75; egg, $6.65; stove, $6.40; mine-run, $5; slack, $4.35; Youghiogheny block, $5.80; lump and egg, $5.35; stove, $5.10; mine-run, $5; screenings, $4; splint block, $5.85; lump, $5.60; egg, $5.80; dock-run, $5; slack, $4.10; anthracite egg, and nut, $12.30; stove, $12.75; pea, $8.70; buckwheat, $7.45.

Domestic demand continued slow in the Southwest in May, with Kansas lump quotations easier. Inquiry for storage coal was unusually limited, with little prospect of Arkansas mines reopening before late July or August. Shovels, however, were fairly active in the production of crushed mine-run for the steam trade.

EXTREME sluggishness featured the Colorado market in May. Very little storage coal was purchased despite price inducements and Texas buyers refrained from buying pending freight adjustments. Ruling prices at the middle of the month were: Domestic lump, $4.50; nut, $4.25; slack, $1.75; Rock Springs-Kemmerer lump, $4.50; nut, $3.75; and slack, $1.50.

May in the Louisville market was comparatively quiet, though the tonnage movement picked up somewhat with increased stocking on the part of retailers, public institutions and railroads. Industrial buying for stockpiles lagged, however. Eastern Kentucky operators complained of low prices. With the increased movement to the Lakes, eastern Kentucky slack is expected to show a further price decline.

May was a lean month for the Cincinnati trade. Lake movement averaged 10,500 cars, as compared to the normal of 12,500 for the period of the year. Still more adverse factors affecting this class of business were reports of large deals made at low prices, scattered, in the main, among producers and thus shutting out the wholesalers. Bad credit conditions prevented stocking on the part of the retailers, depressing buying from this source.

QUALITY smokeless coals were in fair demand, concessions in price affecting only those varieties which were below standard. Egg was the leader, with slack following close behind. Domestic high-volatile coal was a drug on the market, with the exception of 2-in. lump and egg, favored in the Lake market. Because of curtailed production, slack was active and closed strong at the end of the month. Concerted advertising coupled with prospects of advancing prices enabled retailers in Cincinnati to do one of the biggest months' business in several years.

Steadiness ruled the Columbus market in May. Domestic trade was largely confined to the stocking of high-grade fuels. Premium splints and smokeless egg led the list. Steam business was steady, with slack continuing strong, due to curtailed production. Little trend towards the replenishment of stocks was discernible. Mine prices were well maintained over the month.

Hand-to-mouth buying featured the Cleveland market in May. Stocks continued to go down, with no move being made towards replenishment. Excellent transportation conditions are said to be the primary cause of this condition. Pittsburgh No. 8 quotations were: lump, $1.50@$1.75; ¾-in. coal, $1.40@$1.50; nut-and-slack, 90c.@$1; mine-run, $1.35@$1.65, and slack, 85c. @95c.

Light demand, particularly industrial and railroad, in the Pittsburgh market in May was reflected in material curtailments in running time for all producers except those with dock facilities at the lakes. Slack, because of curtailed production, continued in a strong position, with higher than usual prices prevailing. Quotations were as follows: steam slack, $1.10; gas slack, $1.10@$1.25. Mine-run and lump prices were unchanged. Byproduct tonnages contracted for were not as heavy as in other years, it was reported, interest being centered in the spot market. The ruling price on byproduct coal was $1.50@$1.75.

SLUGGISHNESS continued to rule the market in northern West Virginia in May. Consumers failed to show any interest in adding to stocks and buying was held strictly to current requirements. Slack, because of cuts in production, was the leader. Ruling quotations were: lump, $1.50@$2;

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

LOW-VOLATILE, EASTERN	Market Quoted	Week Ended May 3, 1930	May 10, 1930	May 17, 1930	May 24, 1930	May 31, 1930
Smokeless lump	Chicago	$2.25@$2.85	$2.25@$2.85	$2.50@$2.85	$2.50@$2.85	$2.50@$2.85
Smokeless egg	Chicago	2.25@ 3.00	2.25@ 3.00	2.50@ 3.00	2.50@ 3.00	2.50@ 3.00
Smokeless stove	Chicago	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50	2.00@ 2.50
Smokeless nut	Chicago					
Smokeless mine-run	Chicago	1.65@ 2.00	1.65@ 2.00	1.75@ 2.00	1.65@ 2.00	1.75@ 2.00
Smokeless slack	Chicago	1.50	1.50	1.50	1.50	1.50
Smokeless lump	Cincinnati	2.50	2.25@ 2.50	2.35@ 2.50	2.40@ 2.50	2.50
Smokeless egg	Cincinnati	2.75	2.50@ 2.75	2.50@ 2.75	2.60@ 2.75	2.75
Smokeless stove	Cincinnati	2.25	2.25	2.25	2.25	2.25
Smokeless nut	Cincinnati	1.90	1.90	1.90	1.90	1.90
Smokeless mine-run	Cincinnati	1.85@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.85@ 2.00
Smokeless slack	Cincinnati	1.45	1.35@ 1.60	1.35@ 1.45	1.35@ 1.45	1.35@ 1.45
*Smokeless nut-and-slack	Boston	4.00@ 4.05	4.00@ 4.05	3.93@ 4.03	3.85@ 3.93	3.75@ 4.00
*Smokeless mine-run	Boston	4.10@ 4.15	4.10@ 4.15	4.05@ 4.10	4.00@ 4.05	3.95@ 4.05
Clearfield mine-run	Boston	1.25@ 1.75	1.25@ 1.75	1.25@ 1.75	1.25@ 1.75	1.25@ 1.75
Clearfield mine-run	New York	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Cambria mine-run	Boston	1.75@ 2.25	1.75@ 2.25	1.75@ 2.25	1.75@ 2.25	1.75@ 2.25
Somerset mine-run	Boston	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85	1.50@ 1.85
Pool 1 (Navy Standard)	New York	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50	2.25@ 2.50
Pool 1 (Navy Standard)	Philadelphia	2.30@ 2.50	2.30@ 2.50	2.30@ 2.50	2.30@ 2.50	2.30@ 2.50
Pool 9 (super low-vol.)	New York	1.85@ 2.10	1.85@ 2.10	1.85@ 2.10	1.85@ 2.10	1.85@ 2.10
Pool 9 (super low-vol.)	Philadelphia	1.60@ 2.00	1.60@ 2.00	1.60@ 2.00	1.60@ 2.00	1.60@ 2.00
Pool 10 (h. gr. low-vol.)	New York	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Pool 10 (h. gr. low-vol.)	Philadelphia	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Pool 11 (low-vol.)	New York	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75
Pool 11 (low-vol.)	Philadelphia	1.40@ 1.55	1.40@ 1.55	1.40@ 1.55	1.40@ 1.55	1.40@ 1.55
HIGH-VOLATILE, EASTERN						
Pool 54-64 (gas and st.)	New York	$1.05@$1.20	$1.05@$1.20	$1.05@$1.20	$1.05@$1.20	$1.05@$1.20
Pool 54-64 (gas and st.)	Philadelphia	1.00@ 1.15	1.00@ 1.15	1.00@ 1.15	1.00@ 1.15	1.00@ 1.15
Pittsburgh sc'd gas	Pittsburgh	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Pittsburgh gas mine-run	Pittsburgh	1.65@ 1.75	1.65@ 1.75	1.60@ 1.75	1.60@ 1.70	1.60@ 1.70
Pittsburgh mine-run	Pittsburgh	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65
Pittsburgh slack	Pittsburgh	1.10@ 1.25	1.10@ 1.25	1.10@ 1.25	1.10@ 1.25	1.10@ 1.25
Connellsville coking coal	Pittsburgh	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Westmoreland lump	Philadelphia	2.15@ 2.25	2.15@ 2.25	2.15@ 2.25	2.15@ 2.25	2.15@ 2.25
Westmoreland ¾-in. coal	Philadelphia	1.80@ 1.90	1.80@ 1.90	1.80@ 1.90	1.80@ 1.90	1.80@ 1.90
Westmoreland mine-run	Philadelphia	1.65@ 1.75	1.65@ 1.75	1.65@ 1.75	1.65@ 1.75	2.15@ 2.25
Westmoreland slack	Philadelphia	1.10@ 1.20	1.10@ 1.20	1.10@ 1.20	1.10@ 1.20	1.10@ 1.20
Fairmont lump	Fairmont	1.50@ 2.00	1.50@ 2.00	1.50@ 2.00	1.50@ 2.00	1.50@ 2.00
Fairmont ¾-in. coal	Fairmont	1.30@ 1.60	1.30@ 1.60	1.30@ 1.60	1.30@ 1.60	1.30@ 1.60
Fairmont mine-run	Fairmont	1.10@ 1.30	1.10@ 1.30	1.10@ 1.30	1.10@ 1.30	1.10@ 1.30
Fairmont slack	Fairmont	.90@ 1.00	.90@ 1.00	.90@ 1.00	.90@ 1.00	.90@ 1.00
Kanawha lump	Cincinnati	1.50@ 2.50	1.60@ 2.50	1.50@ 2.00	1.50@ 2.50	1.55@ 2.25
Kanawha nut-and-slack	Cincinnati	1.25@ 1.50	1.15@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50
Kanawha mine-run (gas)	Cincinnati	1.40@ 1.50	1.35@ 1.45	1.35@ 1.45	1.40@ 1.50	1.40@ 1.50
Kanawha mine-run (st.)	Cincinnati	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35
Williamson (W. Va.) lump	Cincinnati	1.50@ 2.25	1.60@ 2.25	1.55@ 2.25	1.60@ 2.25	1.60@ 2.25
Williamson (W. Va.) nut-and-slack	Cincinnati	1.15@ 1.60	1.15@ 1.50	1.15@ 1.50	1.15@ 1.50	1.15@ 1.50
Williamson (W. Va.) mine-run (gas)	Cincinnati	1.35@ 1.60	1.35@ 1.60	1.35@ 1.60	1.40@ 1.60	1.40@ 1.60
Williamson (W. Va.) mine-run (st.)	Cincinnati	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35	1.15@ 1.35
Logan (W. Va.) lump	Cincinnati	1.50@ 2.25	1.60@ 2.25	1.60@ 2.25	1.50@ 2.25	1.50@ 2.25
Logan (W. Va.) nut-and-slack	Cincinnati	1.15@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50
Logan (W. Va.) mine-run	Cincinnati	1.15@ 1.50	1.15@ 1.50	1.10@ 1.40	1.10@ 1.50	1.10@ 1.40
Logan (W. Va.) slack	Cincinnati	.80@ 1.00	.85@ 1.00	.85@ 1.00	.90@ 1.00	.90@ 1.00
Hocking (Ohio) lump	Columbus	2.00@ 2.15	2.00@ 2.15	2.00@ 2.15	2.00@ 2.15	2.00@ 2.15
Hocking (Ohio) nut-and-slack	Columbus	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90
Hocking (Ohio) mine-run	Columbus	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65	1.40@ 1.65
Pitts. No. 8 (Ohio) lump	Cleveland	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Pitts. No. 8 (Ohio) ¾-in. coal	Cleveland	1.40@ 1.50	1.40@ 1.50	1.40@ 1.50	1.40@ 1.50	1.40@ 1.50
Pitts. No. 8 (Ohio) mine-run	Cleveland	1.35@ 1.65	1.35@ 1.65	1.35@ 1.65	1.35@ 1.65	1.35@ 1.65
Pitts. No. 8 (Ohio) slack	Cleveland	.85@ .95	.85@ .95	.85@ .95	.85@ .95	.85@ .95

*Gross tons, f.o.b. vessels, Hampton Roads.

¾-in. coal, $1.30@$1.60; egg and nut, $1.25@$1.45; mine-run, $1.10@$1.30; and slack, 90c.@$1.

Conditions in the central Pennsylvania market showed little change in May, as compared to the previous month. Prices were somewhat firmer at the last, as follows: Pool 1, $2.25@$2.40; Pool 71, $2.10@$2.25; Pool 9, $1.90@$2.10; Pool 10, $1.75@$1.90; Pools 11 and 18, $1.60@$1.75.

Lower prices ruled in New England in May, largely caused by demurrage coal at Hampton Roads. Navy Standard smokeless mine-run sold down to $3.92, f.o.b. vessels, Hampton Roads, at the end of the month, with selected grades at $4.05@$4.10. Stoker coal went at $3.75. Steam users, in general, were lukewarm on the subject of coal. Only light tonnages moved by rail from central Pennsylvania into New England in May.

Quietness pervaded the Birmingham market in May, with domestic demand failing to reach the active stage. Prices were scheduled for an advance to the following on July 1: Cahaba lump, $3.45 @$4.15; nut, $2.45@$3.05; Black Creek lump, $3.75@$4; nut, $3.05; Corona lump and egg, $2.80; nut, $2.45; Carbon Hill lump and egg, $2.20; nut, $1.85@ $2.20; Big Seam lump and egg, $1.95; nut, $1.85; Montevallo-Aldrich lump and egg, $5.15; nut, $3.05; Dogwood lump, $4.90; Straven lump, $4.15; and nut, $2.80. Steam coal moved only to a limited extent over the month.

Demand for bituminous coal failed to strengthen in the New York market in May. Consumers bought only as necessity demanded, and irregular operation of industrial plants curtailed tonnage movement about 10 per cent. Producers with railroad contracts were in turn hit by the falling off in freight movement. Except for slack, which was strong, prices in New York were unsettled. Some contracts hanging over from April were closed in May, at 1929 prices or slightly lower.

THE Philadelphia market struck bottom in May, with industrial demand much curtailed and consumers manifesting no interest in the subject of stocking up for the future. Hand-to-mouth buying was dominant throughout the month.

The active demand for domestic anthracite in the New York market, caused by price reductions on April 22, subsided into unmitigated dullness after the first few days of May. This period lasted until nearly the end of the month, when dealers began buying more freely in anticipation of the June 1 price advance. Cash discounts of 25c. on broken, egg, stove, and chestnut, and 20c. on pea were put into effect on May 21. This applies to bills paid within 15 days. One company announced that it would extend 90 days' credit to buyers who do not discount their bills, and also that it would prepay the freight to points east of Buffalo and in Canada. These developments are discussed more fully in the news section of this issue. Activity in steam sizes slackened somewhat in May.

QUIETNESS pervaded the Philadelphia anthracite market in May. One month's operation of the plan of selling anthracite in units of 2,000 lb. has brought out no unusual developments. With the consumer only mildly interested in his next year's supply, his attitude toward the plan did not manifest itself to any marked degree. The unvarying monotony existing over the month was broken slightly at the last, when a spell of unusually cool weather gave a slight fillip to buying, causing a number of householders to lay in their entire supply for next winter. Retail price advances of 25c. scheduled for June 1 were postponed until July 1. However, there was no announcement of any intention to abandon the four monthly increases of 25c., which will make the last one fall on Oct. 1 instead of Sept. 1. Despite an understanding to the effect that no discount would be offered for prompt payment of bills this summer similar to that which prevailed last year, operators entering the Philadelphia market promulgated plans similar to those announced in the New York market.

One of the leading anthracite shippers created a furore in the Chicago market by rebating freight rates to give a reduction of $1@$1.25 on the larger sizes and 50c.@80c. on chestnut. This development, which caused unusual buying, is more fully described in the news section of this issue.

EXPORTS of coal in the month of April, the latest month for which figures are available, were as follows: bituminous, 857,806 gross tons, as compared to 850,963 gross tons in the same month last year; anthracite, 122,918 gross tons, against 160,107 gross tons in April, 1929. Canada, as usual, was our best customer, taking 692,724 gross tons in April, an increase of 44,454 gross tons over the quantity purchased from the United States last year. Imports in April, 1930 and 1929, were 13,114 and 30,719 gross tons of bituminous coal, respectively, and 30,230 and 36,768 gross tons of anthracite, respectively. Great Britain led in imports of bituminous coal, with 12,191 gross tons, as compared to 29,819 gross tons in April, 1929.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

MIDDLE WEST	Market Quoted	Week Ended May 3, 1930	May 10, 1930	May 17, 1930	May 24, 1930	May 31, 1930
Franklin, Ill., lump	Chicago	$2.40	$2.40	$2.40	$2.40	$2.40
Franklin, Ill., mine-run	Chicago	2.15	2.15	2.15	2.15	2.15
Franklin, Ill., screenings	Chicago	1.60@ 1.85	1.60@ 1.85	1.60@ 1.85	1.60@ 1.85	1.60@ 1.85
Central Ill., lump	Chicago	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90	1.75@ 1.90
Central Ill., mine-run	Chicago	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75
Central Ill., screenings	Chicago	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60
Ind. 4th Vein lump	Chicago	2.40@ 2.50	2.40@ 2.50	2.40@ 2.50	2.40@ 2.50	2.40@ 2.50
Ind. 4th Vein mine-run	Chicago	1.50@ 2.10	1.50@ 2.10	1.50@ 2.10	1.50@ 2.10	1.50@ 2.10
Ind. 4th Vein screenings	Chicago	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50
Ind. 5th Vein lump	Chicago	2.00@ 2.20	2.00@ 2.20	2.00@ 2.20	2.00@ 2.20	2.00@ 2.20
Ind. 5th Vein mine-run	Chicago	1.30@ 1.65	1.30@ 1.65	1.30@ 1.65	1.30@ 1.65	1.30@ 1.65
Ind. 5th Vein screenings	Chicago	.80@ 1.00	.80@ 1.00	.80@ 1.00	.80@ 1.00	.90@ 1.10
Mt. Olive lump	St. Louis	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Mt. Olive mine-run	St. Louis	1.65	1.65	1.65	1.65	1.65
Mt. Olive screenings	St. Louis	1.35@ 1.45	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35
Standard (Ill.) lump	St. Louis	1.65@ 1.75	1.65@ 1.75	1.65@ 1.75	1.65@ 1.75	1.65@ 1.75
Standard (Ill.) mine-run	St. Louis	1.50	1.50	1.50	1.50	1.50
Standard (Ill.) screenings	St. Louis	1.15@ 1.35	1.15@ 1.25	1.15@ 1.25	1.15@ 1.25	1.15@ 1.25
West Ky. lump	Louisville	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50
West Ky. mine-run	Louisville	.95@ 1.25	.95@ 1.25	.95@ 1.25	.95@ 1.25	.95@ 1.25
West Ky. slack	Louisville	.85@ 1.00	.85@ 1.00	.85@ 1.00	.85@ 1.00	.85@ 1.00
West Ky. lump	Chicago	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35
West Ky. mine-run	Chicago	.85@ 1.30	.85@ 1.30	.85@ 1.30	.85@ 1.30	.85@ 1.30
West Ky. screenings	Chicago	.85@ 1.00	.85@ 1.00	.85@ 1.00	.85@ 1.00	.65@ .85
SOUTH AND SOUTHWEST						
Big Seam lump	Birmingham	$1.85	$1.85	$1.85	$1.85	$1.85
Big Seam mine-run	Birmingham	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75	1.60@ 1.75
Harlan (Ky.) block	Chicago	2.00	2.00	2.00	2.00	2.00
Harlan (Ky.) slack	Chicago	1.00@ 1.25	1.00@ 1.25	1.00@ 1.25	1.00@ 1.25	1.00@ 1.25
Harlan (Ky.) block	Louisville	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Harlan (Ky.) nut-and-slack	Louisville	1.50	1.50	1.50	1.50	1.50
Harlan (Ky.) mine-run	Louisville	1.50	1.50	1.50	1.50	1.50
Harlan (Ky.) block	Cincinnati	1.65@ 2.25	1.65@ 2.25	1.65@ 2.25	1.75@ 2.25	1.75@ 2.25
Harlan (Ky.) nut-and-slack	Cincinnati	1.15@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50
Harlan (Ky.) mine-run	Cincinnati	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60	1.25@ 1.60
Hazard (Ky.) block	Chicago	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00	1.75@ 2.00
Hazard (Ky.) slack	Chicago	.90@ 1.15	.90@ 1.15	.90@ 1.15	.90@ 1.15	.90@ 1.15
Hazard (Ky) block	Louisville	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Hazard (Ky.) nut-and-slack	Louisville	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50
Hazard (Ky.) mine-run	Louisville	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50	1.25@ 1.50
Hazard (Ky.) block	Cincinnati	1.65@ 2.25	1.65@ 2.25	1.65@ 2.25	1.65@ 2.25	1.60@ 2.25
Hazard (Ky.) nut-and-slack	Cincinnati	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50
Hazard (Ky.) mine-run	Cincinnati	1.15@ 1.35	1.15@ 1.35	1.10@ 1.45	1.15@ 1.45	1.15@ 1.45
Elkhorn (Ky.) block	Chicago	2.15	2.15	2.15	2.15	2.15
Elkhorn (Ky.) slack	Chicago	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35	1.25@ 1.35
Elkhorn (Ky. block	Louisville	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Elkhorn (Ky.) nut-and-slack	Louisville	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50	1.35@ 1.50
Elkhorn (Ky.) mine-run	Louisville	1.40	1.40	1.40	1.40	1.40
Elkhorn (Ky.) block	Cincinnati	1.75@ 2.75	1.75@ 2.75	1.75@ 2.75	1.75@ 2.75	1.75@ 2.75
Elkhorn (Ky.) nut-and-slack	Cincinnati	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.50	1.10@ 1.45
Elkhorn (Ky.) mine-run	Cincinnati	1.10@ 1.65	1.10@ 1.60	1.10@ 1.60	1.15@ 1.60	1.15@ 1.60
Kansas shaft lump	Kansas City	3.50	3.50	3.50	3.50	3.50
Kansas strip lump	Kansas City	2.50	2.50	2.50	2.50	2.50
Kansas mine-run	Kansas City	2.50	2.50	2.50	2.50	2.50
Kansas crushed mine-run	Kansas City	1.85	1.85	1.85	1.85	1.85
Kansas screenings	Kansas City	1.85	1.85	1.85	1.85	1.85

WORD from the FIELD

Industrial Coal Reserves Drop To 25 Days' Supply

Stocks of anthracite and bituminous coal in the hands of industrial consumers in the United States and Canada on May 1 were 30,700,000 net tons, according to the monthly report of the National Association of Purchasing Agents, Inc. This figure is equal to 25 days' supply, based on the April consumption of 36,250,000 net tons. Thus, the association says, stocks are now 500,000 tons lower than the lowest point last year. In other words, the days' supply on hand is one day less than during June and July, 1929, the lowest months of the year.

It is not unreasonable, the association asserts, to expect stocks to go slightly lower between now and July 1. After that, the turning point should come and total stocks begin to increase. With nothing in sight that could effectively create a shortage of coal within a short period of time, the present situation is a healthy one for industries as a whole, as it follows out the policy of keeping low inventories, thus eliminating waste through storage and non-productive outlay.

Days' Supply of Bituminous Coal in Various U. S. Industries

Byproduct coke	17	Railroads	18
Electric utilities	45	Steel mills	27
Coal-gas plants	46	Other industries	28
Average total bituminous stocks throughout the United States			24

Estimates of Output, Consumption and Stocks, in Net Tons

	United States Production	Industrial Consumption	On Hand in Industries
April, 1929	43,329,000	37,750,000	35,385,000
May	46,480,000	37,298,000	33,468,000
June	42,969,000	34,485,000	31,282,000
July	45,635,000	35,040,000	31,415,000
August	49,843,000	34,886,000	32,712,000
September	51,307,000	35,960,000	34,289,000
October	59,567,000	39,482,000	36,107,000
November	51,719,000	38,747,000	37,313,000
December	53,858,000	38,581,000	37,512,000
January, 1930	56,816,000	38,512,000	39,007,000
February	45,712,000	35,195,000	37,078,000
March	40,324,000	37,083,000	36,554,000
April	40,776,000	36,230,000	31,535,000
May 1	.....	.....	30,700,000

Commercial stocks of bituminous coal, used largely for industrial purposes, amounted to 33,100,000 tons on April 1, 1930, according to the quarterly survey of the U. S. Bureau of Mines. This is a decrease of 7,200,000 tons from the total on hand at the beginning of the previous quarter, and 3,800,000 tons from the quantity in storage on the same date last year.

Exports during the first quarter of 1930 averaged 219,000 tons a week, as against 226,000 tons during the same period last year. The weekly rate of home consumption during the first quarter amounted to 10,432,000 tons, as compared with 10,782,000 tons in the previous quarter. In comparison with the same period last year, the rate of home consumption plus exports shows a decrease of 883,000 tons, or 7.7 per cent. In addition to the stocks in the hands of consumers, there was 3,976,910 tons of bituminous coal on hand on the docks of Lake Superior and Lake Michigan on April 1, as compared with 8,026,065 tons on Jan. 1.

Stocks of anthracite in retail yards on April 1, according to Bureau of Mines estimates, show the usual seasonal decline, being 29 per cent less than the amount on hand three months ago. They are, however, somewhat higher than on the corresponding date of last year.

Chicago Favors Dustless Coal

Chicago coal consumers are in favor of treating coal to make it dustless, according to the report of a special committee, given at a meeting of the Chicago Coal Merchants' Association last month. The committee report showed that 112 customers reached by questionnaire were in favor of dustless coal and 11 were against it. For the dealers, 108 were satisfied with the present method of treating coal to make it dustless and 13 were dissatisfied. In answer to the question as to whether the treatment of coal was a step in the right direction for the industry as a whole, 114 dealers voiced approval, against 7 who opposed it.

Alabama First-Aid Meet Set

The twelfth annual Alabama first-aid contest will be held at the City Auditorium, Birmingham, Ala., July 12, under the auspices of the Alabama Mining Institute, U. S. Bureau of Mines, Alabama State Department of Mines, American Red Cross, and the Joseph A. Holmes Safety Association. Thirty-five teams from all parts of the state are expected to participate.

Consolidation Coal Company Offers New Sales Plan

Complete co-operation between producer, dealer and consumer is the avowed object of the new domestic coal merchandising policy announced by J. Noble Snider, vice-president in charge of sales, Consolidation Coal Co. Taking an opposite view from that held in some quarters, Mr. Snider said that the solution of the merchandising problems of the industry does not require a "chain of yards controlled by producers." But to assure complete co-operation, a major part of the plan will be "establishment of authorized Consolidation dealers."

Each dealer will be granted a franchise allowing him to sell one class of Consolidation coal, which will be branded. The company, in consideration of the dealer's acceptance of the terms of the franchise, undertakes to do the following: maintain a sufficient and uninterrupted supply of good, well-prepared coal; established prices (with summer reductions) for twelve months in advance which will allow the dealer a fair margin; back up the dealer with newspaper space and other advertising aid; help him with merchandising plans, and render engineering assistance.

Coincident with the disclosure of the new sales plan, the Consolidation company announced three new trade names, as follows: Pocahontas coal, "Volunteer"; Millers Creek coal, "Grenadier"; Fairmont coal, "Pathfinder." These are in addition to the old "Cavalier" and "Mountaineer" brands.

To Attack Acid Mine Drainage

Co-operation in the solution of the problem of stream pollution by acid mine drainage has been assured the West Virginia State Water Commission by six representatives of the West Virginia Coal Association, headed by Brooks Fleming, Fairmont, W. Va., assistant to the president, Consolidation Coal Co. E. S. Tisdale and L. K. Herndon, secretary and chemical engineer of the water commission, respectively, have been appointed to work out a statement of principles in regard to acid drainage for submission to the coal association. The latter then expects to name a committee to work with the water commission.

Lewis and Aids Face Contempt Action in Illinois; Anthracite Miners Discuss New Contract

THE TRIAL of John L. Lewis, president, United Mine Workers, and a number of his followers for alleged violation of the terms of the injunction granted Oct. 10, 1929, on petition of officers of District 12 (Illinois) restraining the Lewisites from attempting to set up a provisional government in that district, and the tri-district convention of the anthracite miners at Hazleton, Pa., held the center of the stage in labor circles last month. Only slightly less as a matter of interest was the action of the Consolidation Coal Co. in cutting wages in northern West Virginia.

Lewis and his aids were cited on April 17 by Circuit Judge Frank W. Burton, Springfield, Ill., to show cause why they should not be attached and held in contempt of court. Hearing of the issues was set for April 30. On May 1, attorneys for Lewis and his associates filed an answer to the contempt charges, admitting that they had attempted to set up a provisional government but contending that the action of Harry Fishwick, president of District 12, and others in setting up a "dual" union nullified the injunction. Judges Burton, Charles G. Briggle, and Norman L. Jones ordered hearings on violation of the injunction set for May 19, and gave counsel for Lewis until May 9 to file supplemental answers to the citations and allowed counsel for the District 12 officers until May 14 to file further pleadings.

Broadening of the injunction to restrain Lewis and his associates from acting "or pretending to act as officers of the United Mine Workers of America" or from using the name was requested on May 14 by counsel for District 12. The petition set forth that the rightful officers of the organization were those elected at the insurgent convention, held in Springfield, Ill., March 10, and that Lewis was continuing to exercise the functions of executive unlawfully. District 12 counsel also filed exceptions to Lewis' contention that the formation of the insurgent union had nullified the terms of the injunction.

Actual trial began on May 19 before Frank L. Trutter, master in chancery, Springfield, Ill. The insurgents won the first skirmish when it was ruled that the trial should proceed on the question of violation rather than the validity of the injunction. An early decision in the case is not expected. After the violation trial is over, the validity question, it is said, will be settled.

In the anthracite region, where the present agreement expires Aug. 31, the tri-district miners' convention met at Hazleton, Pa., April 30, for the purpose of outlining a program to be followed in the coming negotiations with the operators. Lewis acted as permanent chairman of the meeting, and in his opening address expressed the wish that the convention would not proceed in accordance with its own wishes but to the "best interests" of the membership of the United Mine Workers.

Report of the scale committee, which was adopted May 6, provided that committee chosen to negotiate be instructed "to secure the best and most satisfactory agreement with the anthracite operators, on the basis of no reduction in wages," and that every effort be made "to secure equal division of working time among anthracite mine workers." Other points recommended by the scale committee for consideration during the coming negotiations were: protection of qualified seniority; abolition of the individual contract system; discontinuance of the practice of replacing workers with monthly men or bosses during idle periods; a convenient arrangement for the collection of union dues, and the elimination of abuses and the improvement of working conditions. The report as finally adopted defeated efforts by Lewis to have the coming negotiations carried out on the basis of the present wage scale.

AFTER the close of the convention, representatives of the miners and the anthracite operators tentatively decided on June 9 as the date for opening negotiations on the new contract, but the meeting later was postponed. Definite announcement as to the date is expected about June 15. Six miners and six operators were scheduled to take part in the deliberations. Operating men named are as follows: W. W. Inglis, Glen Alden Coal Co.; Richard F. Grant, Lehigh Valley Coal Co.; A. J. Maloney, Philadelphia & Reading Coal & Iron Co.; F. W. Leamy, Hudson Coal Co.; Alvan Markle, Jr., Jeddo-Highland Coal Co., and either Michael Gallagher or J. C. Brydon, of the Pittston Co.

The wages of 2,500 to 3,000 miners in the Fairmont field of West Virginia were cut 12 to 15 per cent on May 1 by the Consolidation Coal Co. This action, said George J. Anderson, president, was the result of a two-year attempt to help stabilize the bituminous industry and to end overproduction and price-cutting, which left the company on an isolated basis in the field and necessitated a temporary abandonment of "a constructive program of wage and market policies."

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Business Gets a Setback

The upward trend in volume of general business and industry which has been under way throughout the country since the opening of the second quarter appears to have received a setback during the closing weeks of May. General manufacturing during May, as indicated by the consumption of electrical energy for power purposes, was about on the same level as during April, indicating that production is holding up unusually well for this season of the year.

But general mercantile trade appears to have witnessed a decided downward trend starting about the second week in May. The close of May found general trade at the lowest point since the middle of February, or on a plane about 7.3 per cent below the estimated normal, as compared with 10.3 per cent above the estimated normal at the close of May, 1929. It now seems doubtful if any material improvement in general business will be witnessed much before the opening of the fall months.

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Western Maryland Marketing To Be Investigated

An investigation to determine why western Maryland is losing out in the Baltimore (Md.) coal market is to be made by a committee of operators, who also will inquire into the present use of Maryland timber for use in the mines. The committee is headed by John S. Brophy, president, Piedmont & Georges Creek Coal Co., Frostburg, Md. A. B. Stewart, president, Davis Coal & Coke Co., Baltimore, Md., is vice-chairman.

To further the movement toward "Maryland Coal for Maryland People," representatives of the coal interests and the general public discussed ways and means at a dinner at the Fort Cumberland Hotel, Cumberland, Md., May 27, given by the Cumberland Chamber of Commerce. Addresses were made by Mr. Brophy; H. A. Glover, New York City, general manager of sales, Consolidation Coal Co., and others. Mr. Glover outlined the results of a similar movement in Indiana, and gave pointers on how the problem of stimulating Maryland sales could be attacked.

Early in May, the Maryland Bureau of Mines suggested that householders in the state follow in the paths of residents in the cotton-producing states, where, just before the World War, the "buy-a-bale" campaign was advocated to relieve depression in the industry. In a similar manner, the State Bureau of Mines urges that people buy their winter's coal early in the summer, holding it as the cotton purchasers did, and thus allowing the mines to run steadily and give steady employment to the workers.

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Anthracite Club Elects

Merchandising as a means of regaining markets lost to anthracite was the theme of an address made by Noah H. Swayne, 2d, executive director of the Anthracite Institute, at the first meeting of the Anthracite Club of New York City for the new business year, held at the Hotel McAlpin, New York City, May 15. At the annual election, the old officers were re-elected, as follows: president, Oscar F. Ostby, president, Domestic Stoker Co.; vice-president, A. E. Duemler, manager, Anthracite Coal Service; treasurer, L. N. Burnside, Delaware, Lackawanna & Western Coal Co.; and secretary, Noel B. Cunningham, all of New York City.

Retail Association Sponsors Summer Sales Campaign

A summer coal-selling campaign made up from the outstanding coal advertising of the country, has been announced by Harry Turner, chairman of the public relations committee of the National Retail Coal Merchants' Association. This campaign, to be sold to the dealer at less than it would cost him to have it printed himself, has the backing of the entire coal industry, as represented on the executive committee composed of C. E. Bockus, president, National Coal Association; Samuel D. Warriner, president, Anthracite Institute; Warren Bixler, president, American Wholesale Coal Association, and Milton E. Robinson, Jr., president, National Retail Coal Merchants' Association.

Briefly, the campaign consists of a folder, a series of three postcards, a series of three blotters, and six newspaper advertisements in one-, two- and three-column sizes. Modern type faces and quality illustrations have been employed, and the plan is available to all dealers whether or not they are members of the National Retail association. The campaign will particularly appeal to those dealers who wish to advertise their own company rather than the operator's trade name, though material on special coals may be incorporated in the dealer's individual imprint.

Coal and Heating Interests Hold Contact Meeting

For the purpose of outlining a practical program of co-operative activities, representatives of the coal industry and the coal-heating industry held a meeting at the Union League Club, Chicago, May 8, with H. A. Glover, chairman, trade relations section, Market Research Institute, National Coal Association, presiding. The chief result of the meeting was the adoption of a resolution providing for the appointment of a co-operative committee of ten members, representative of the following groups: National Coal Association, Anthracite Institute, American Wholesale Coal Association, National Retail Coal Merchants' Association, National Warm Air Heating Association, Institute of Boiler and Radiator Manufacturers, Heating and Piping Contractors' National Association, Stoker Manufacturers' Association, Midwest Stoker Association, and Accessories (Control and Service).

Plans were made for an interchange of information between the different associations whereby all interested parties might be kept posted on all developments in coal-burning and coal-handling equipment. The desirability of contact with architects and contractors was stressed, and emphasis was placed on the need of a standard chimney code. Numerous plans whereby sales programs of heating equipment and coal interests might be co-ordinated were discussed, and a long list of "abuses," both on the part of equipment people and coal interests, were thrashed out.

The committee representing the coal industry was composed of Mr. Glover; J. W. Darville, Philadelphia, Pa., vice-president, General Coal Co.; Norvin H. Vauhan, Chicago, assistant general sales agent, Consolidated Coal Co. of St. Louis; and C. B. Huntress, executive secretary, National Coal Association. Other coal men who spoke at the meeting were: Wilson Bridges, Chicago, general sales manager, Chicago, Wilmington & Franklin Coal Co.; Everett Drennen, Denver, Colo., vice-president, Colorado Fuel & Iron Co.; and F. C. Honnold, Chicago, secretary, Illinois Coal Bureau.

Chicago Sales Stimulated By Surety Plan

To stimulate summer buying, several Eastern operators entering the Chicago market are relying on a surety plan to increase the volume of buying during the warmer months. Under the plan, the producers prepay the freight and extend 90 days' credit to the dealers on both freight and coal. To insure themselves against loss, the mine owners then apply to an indemnity company for insurance against non-payment of the bill, at a rate varying from $\frac{1}{4}$c. to $\frac{1}{2}$c. per ton. While this plan has been in force on dock shipments for some time and was applied to a limited extent last year in the Chicago market, its wide extension this year is somewhat of an innovation. Operators are obliged to make every effort to collect bills, but in case of failure, they are turned over to the surety companies, which pay the losses and take over the problem of collection.

Lake Cargo Coal Rate Case Reopened by I.C.C.

The Lake cargo coal rate case was reopened by the Interstate Commerce Commission by an order issued May 21. The commission denied petitions of the Chesapeake & Ohio R.R., Virginian Ry., Norfolk & Western Ry., and Louisville & Nashville R.R. seeking dismissal of the complaints brought by the Ohio Lake Cargo Coal Rate Committee and the Western Pennsylvania Coal Traffic Bureau against the Baltimore & Ohio R.R. and others. These complaints charge that the present rates maintained by Northern railroads on shipments of Lake cargo coal are unreasonable, prejudicial to the Northern fields and preferential to the Southern fields. Hearing on the complaints was set for June 16, at Washington, D. C.

New Plant Construction

New contracts for topworks and construction under way or completed at various coal operations reported for the month of May are as follows:

C. C. B. Smokeless Coal Co., Mount Hope, W. Va.; contract closed with Roberts & Schaefer Co. for Menzies hydro-separator coal-washing equipment; capacity, 80 tons per hour of stove and pea coal.

Cambridge Collieries Co., Cambridge, Ohio; contract closed with Roberts & Schaefer Co. for three-track, all-steel, Marcus tipple, equipped with loading booms and rock-disposal machinery for preparing lump, egg and slack; capacity, 300 tons per hour; to be completed Aug. 1.

Commercial Fuel Co., Pittsburg, Kan.; contract closed with Pittsburg Boiler & Machine Co. for four-track, all-steel tipple for new strip mine, equipped with loading booms, degradation conveyor, boney conveyor, shaking screens, reclaiming conveyor, rescreens, primary breaker, and secondary crusher; capacity, 250 tons per hour.

Clinchfield Coal Corporation, Clinchco, Va.; contract closed with Roberts & Schaefer Co. for three-track, all-steel, Marcus tipple, equipped with loading booms, car feeders, revolving dump and retarding conveyor for preparing lump, egg, stove, and slack coal; capacity, 300 tons per hour; to be completed Nov. 15.

Elkhorn Collieries Corporation, Thornton, Ky.; contract closed with Morrow Mfg. Co. for tipple equipment consisting of dump, reciprocating plate feeder, scraper conveyor, screens for three tracks, and loading booms; capacity, 125 tons per hour.

Hanna Coal Co., Fairpoint, Ohio; contract closed with Morrow Mfg. Co. for crusher, chutes, and supporting structure; capacity, 250 tons per hour.

Jefferson Coal Co., Piney Fork, Ohio; contract closed with Morrow Mfg. Co. for crushing equipment, slack conveyor, mixing and re-assembling conveyor, refuse conveyor and elevator, and supporting structure; capacity, 200 tons per hour.

Kentucky Cardinal Coal Corporation, Cardinal, Ky.; contract closed with Roberts & Schaefer Co. for Menzies hydro-separator coal-washing equipment; capacity, 100 tons per hour of stove and pea coal.

Malakoff Fuel Co., Malakoff, Texas; contract closed with Pittsburg Boiler & Machine Co. for a shaft tipple to prepare 4-in. lump and 4x0-in. coal; capacity, 100 tons per hour.

Mead Smokeless Coal Co., Mead, W. Va.; contract closed with Roberts & Schaefer Co. for Menzies hydro-separator coal-washing equipment; capacity 75 tons per hour of egg coal.

Wells-Elkhorn Coal Co., Garrett, Ky.; contract closed with Morrow Mfg. Co., for reciprocating plate feeder, scraper, conveyor, screens over three tracks, and loading booms; capacity, 125 tons per hour.

Youghiogheny & Ohio Coal Co., Rayland, Ohio; contract closed with Morrow Mfg. Co. for crushing equipment, slack conveyor, mixing or re-assembling conveyor, and steel supporting structure; capacity, 500 tons per hour.

Bureau of Mines Approves Explosive

One change in the active list of permissible explosives was made by the U. S. Bureau of Mines in May. Details are given below.

Change in the Active List of Permissible Explosives During the Month of May*

	Vol. Poisonous Gases	Characteristic Ingredient	Weight of 1¼x8-In. Cartridge, Grams	Smallest Permissible Diameter, Inches	Unit Deflective Charge, Grams	Rate of Detonation in 1¼-In. Diameter Cartridge, Ft. per Sec.
Genite B[1]	B	Ia	141	1	217	11,120

*Class designations are fully explained in *Coal Age*, July, 1929, p. 430. [1]General Explosives Corporation, Latrobe, Pa.

Railway Fuel Association Holds Meeting

Progress in the use of fuel was the theme of the twenty-second annual meeting of the International Railway Association, held at the Hotel Sherman, Chicago, May 6-9. Over 2,000 railway executives, equipment supply men, company fuel men, and coal men from all sections of the United States, Mexico, and Canada heard speakers emphasize the necessity for still further economies and elimination of the human element in the firing of railway locomotives.

Representing the coal industry, C. E. Bockus, president, National Coal Association, on May 6, pointed out the mutuality of interest between railroads and bituminous coal producers. Stressing the fact that the industry has always furnished the country with an ample supply of quality fuel at a price lower than that of any of its industrial competitors, President Bockus declared that the public should be expected to pay for the margin in productive capacity which safety demands. He hailed the step taken by railways toward direct contractual relations with the producers and the reduction of the spread between maximum and minimum requirements as a means of stabilizing relations between the two groups.

Preceding the meeting, contact committees of the Fuel Association and the National Coal Association met on May 5, with C. H. Dyson, fuel agent, Baltimore & Ohio R.R., Baltimore, Md., presiding. The policy to be followed in buying railroad coal was discussed, and Mr. Dyson was instructed to recommend on the following Thursday that all railroads adopt the policy already entered into by the Eastern lines *(Coal Age,* May, 1930, p. 337), in order to stabilize fuel purchases. Co-operation of the committee was pledged to make the policy a success.

At the closing session of the convention, the following officers were elected for the coming year: president, Mr. Dyson; vice-presidents, W. G. Black, mechanical assistant to the president, Chesapeake & Ohio R.R., Cleveland, Ohio; C. I. Evans, chief fuel supervisor, Missouri-Kansas-Texas R.R., Parsons, Kan.; and J. M. Nicholson, fuel conservation engineer, Atchison, Topeka & Santa Fe R.R., Topeka, Kan.

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Federal Mine Foremen Banquet

Improvements in accident records made by the foremen at the two mines of the New England Fuel & Transportation Co., Grant Town, W. Va., were celebrated at the annual banquet of the Federal Mines Foremen's Club, held in Fairmont, W. Va., May 24. W. H. Forbes, safety engineer, acted as toastmaster and awarded prizes to L. R. Cosner, James Boyd, and J. H. Powell for merit in attendance, discussion, and home work during the year of foremanship development classes conducted by the School of Mines, West Virginia University. Mr. Cosner, who has completed his second year of training, operated his section of the mine, which includes practically all pillar work, 424 days without an accident, as compared to 22 accidents in ten months before starting the training course.

Reviewing the safety accomplishments of the New England company in the last year, Mr. Forbes said that the combined tonnage per lost-time injury for the two mines was 20,635, against less than 5,000 tons per injury in 1927, the year before foreman training was started. Other speakers at the banquet included Michael P. Grady, foreman, Pennsylvania Railroad shops, Canton, Ohio, and Adam Crawford, assistant director, mining extension department, School of Mines, West Virginia University.

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Financial Reports Issued

Philadelphia & Reading Coal & Iron Corporation and subsidiaries, for the quarter ended March 31, report net income of $630,007 after interest, depreciation, depletion, and other charges, against a net loss of $43,905 in the first quarter of 1929.

Hudson Coal Co., for the year 1929, reports net income of $651,224 after depreciation, depletion, interest, and other charges, equivalent to $3.67 a share on 117,482 shares of stock outstanding. This compares with a net loss of $1,416,458 in 1928. L. F. Loree, president, in a message to the stockholders, said that anthracite demand improved slightly in 1929, and that a vigorous effort to regain lost markets was reflected in the increased tonnage produced.

Lehigh Valley Coal Corporation, for the three months ended March 31, reports a net loss of $150,593 after interest, federal taxes, depreciation, depletion, minority interest, and miscellaneous deductions, against a net profit of $467,785 in the first three months of 1929.

Old Ben Coal Corporation reports net income of $359,159 in 1929, equal to $7.18 a share on its $8 preferred stock, against a net loss of $133,552 in 1928.

Pittsburgh Terminal Coal Corporation, for the quarter ended March 31, reports a net loss of $216,653 after depreciation, depletion, and other charges. This compares with a net loss of $96,647 in the first quarter of 1929.

Truax-Traer Coal Co. and subsidiaries, for the quarter ended March 31, report net profit of $138,327 after depreciation, depletion, interest, and federal taxes, equal to 56c. a share on 245,000 shares of no-par capital stock.

Electric Shovel Coal Corporation reports net profit of $257,375 in 1929 after interest, depreciation, depletion, and federal taxes, equal, after preferred dividend requirements, to 7c. a share on the outstanding common stock. This compares with net profit of $316,719 in 1928, equal to 43c. a share on the common stock.

Cosgrove-Meehan Coal Corporation, for the quarter ended March 31, reports net profit of $74,256, against a net profit of $68,675 in the first three months of 1929.

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W. Va. Southern Properties Sold at Auction

Properties of the bankrupt West Virginia Southern Coal Co., Huntington, W. Va., consisting of 12,100 acres of leaseholds and mine equipment at Eskdale, Whitesville, Birchton, Marfork, and Silush, W. Va., were sold at Charleston, W. Va., May 17, for $111,659. Except for three small tracts in Raleigh County, the sale later was confirmed by the referee in bankruptcy. Landlords who bid in the properties were: Rowland Land Co., Coal River Mining & Lumber Co., Ohley Land Co., Courtney Land Co., and the Leevale Coal Co. Liabilities were more than $3,200,000, and the properties were appraised at $618,000.

Supplementing the establishment of quality standards for brands, the M. A. Hanna Co., Cleveland, Ohio, is designating its anthracite collieries with signs such as shown in the accompanying illustration. These signs advertise the hard-coal product of the Susquehanna Collieries Co., and are kept in good condition as a part of the company's program of maintaining the good order and attractiveness of grounds and buildings.

Washington Letter

By Paul Wooton
Special Correspondent

LACK of statistics covering the movement of coal from the producing field to its destination constitutes the blind spot in the bituminous coal industry's knowledge of its market. Production is well covered by the statistics of the U. S. Bureau of Mines. With the inauguration of quarterly reports on consumers' stocks the item of storage is covered, although there is demand for stock reports at more frequent intervals. The decennial census of 1930 includes the consumption of coal in manufacturing, and will get for the first time the quantities handled by retail coal dealers.

Useful as these sources of information are, sales managers need to know what coals are moving to what markets. Like other commodities, coal is not sold on national averages, but to particular consumers in particular places. The harassed sales manager wants to know how much coal from his district is moving into the accessible markets. Knowing his own business, he then can determine whether his sales force is getting a fair share of the total business.

This angle of distribution was explored by C. E. Lesher, formerly in charge of coal statistics for the U. S. Geological Survey and the war-time fuel administration, in his classic reports on distribution in 1917 and 1918. These old reports traced the movement from each producing field to each consuming state. For years these reports were in constant use in the trade. But distribution changes more rapidly, perhaps, than any other element in the marketing of coal. The tremendous shifts in business which set in after the Jacksonville wage agreement have robbed the war-time study of any save historical interest.

There has been, therefore, a widespread demand for current, up-to-date figures on the movement from mine to market. The Bureau estimated the cost of such a service at $8,600 and this sum was duly appropriated by Congress. The money will become available July 1 and the Bureau is laying plans for the work. The objective, as stated by Director Turner in testimony before the Appropriations Committee, is the securing of detailed annual reports tracing the movement of coal from each of the major producing districts to each consuming state. It also is expected that a quarterly summary will be presented showing the principal movements, such as that in the Lakes, tidewater, New England, and trans-Mississippi trades.

It is realized fully that the collection of figures alone will accomplish no useful purpose. Figures are useful only when they are used, but it is one of the hopeful signs of the coal industry that many companies are devoting attention to market analysis. A progressive coal company builds up records of its own business and analyzes its actual and potential sales, just as does the successful manufacturer. The establishment of the distribution service is in line with the desires of *Coal Age*, as expressed editorially over a period of years. *Coal Age* has pointed out repeatedly the need for better distribution statistics. The publication is given credit with having been an important factor in convincing Congress that the presentation of such data is in the public interest.

James Ellwood Jones

Vice-president in charge of operations, Pocahontas Fuel Co., whose home is in Switchback, W. Va., has announced that he will be a candidate for the office of United States Senator from West Virginia on the Republican ticket. Mr. Jones, who was born in Pennsylvania and brought up in the Pocahontas field, is a graduate engineer, a member of the American Institute of Mining and Metallurgical Engineers and the American Mining Congress, and is the inventor of the "Colodar."

Wakenva Company Sold

Lands, interests in lands, and leases held by the Wakenva Coal Co. and the Amalgamated Coal Corporation, Knoxville, Tenn., brought $75,000 at a receivership sale at Lebanon, Va. The Wakenva Coal Co., operating mines in Virginia and adjoining states was thrown into the hands of the receiver in November, 1929. Liabilities were listed at more than $1,000,000, and assets were given as properties operated by the company.

At the sale, the Upper Banner Coal Corporation properties, largely in Dickenson County, Virginia, were bought by the Upper Banner company; Buckhorn properties in Tazewell County, Virginia, were purchased by the Buckhorn Coal Co.; Virginia Banner Coal Co. properties in Dickenson County, Virginia, by C. W. Cowden and others; Hill Creek Coal Co. properties in Tazewell County, Virginia, by James W. Harman and others; and the Kennedy Coal Co. properties in Russell County, Virginia, by P. F. Brown. Dickenson County properties sold embraced 1,013 acres of coal land; Tazewell County properties, 230 acres; and Russell and Buchanan properties, 2,909 acres.

Cash Discount Plan Offered Anthracite Dealers

To stimulate summer buying, anthracite producers inaugurated last month a cash discount plan for dealers who pay their bills promptly. Beginning May 21 and extending to Aug. 21, operators allow, in addition to regular reductions in circular prices, deductions of 25c. per ton on broken, egg, stove, and chestnut sizes, and 20c. per ton on pea coal, when bills are paid within 15 days. This plan is a modification of the cash discount scheme adopted last summer and discontinued on Oct. 1, 1929.

As a further incentive to summer buying, the Delaware, Lackawanna & Western Coal Co. is extending 90 days' credit to dealers who do not discount their bills, and is giving the following reductions for payment in less than 90 days: 60 days, ½ per cent; 30 days, 1 per cent, and 10 days, 25c. per ton. This contrasts with the 15 days' time and discount of 20c. on pea coal offered by the other companies. In addition, the Delaware company announced that it would prepay the freight on shipments to points east of Buffalo and in Canada, and that the cash discount would apply both to coal and freight.

Rebate Given on Chicago Anthracite Rates

Freight rebates on anthracite to points west of Buffalo were announced on May 26 by the Philadelphia & Reading Coal & Iron Co., as follows: grate, egg, and stove in hopper cars, $1.25 per ton; in box cars, $1 per ton; chestnut in hoppers, 80c., and in box cars, 55c. Rebates apply only when bills are paid within 30 days. Though subject to change without notice, it is understood that figures for the entire year are provided in the scheme, but were not made public because of the possibility of an adjustment in August. Retailers ordering anthracite are instructed to pay the freight and submit the bills to the producer at the end of the month for refunds.

The object of the plan is said to be an ultimate reduction in freight rates to points west of Buffalo, as the Reading company, it is said, expects to present results of the operation of the plan over the period of a year to carriers to show what they may expect from the heavier anthracite traffic moving under the lower rate. Hard-coal operators are anxious to regain markets in the Middle West, particularly Chicago, and the rest of the producers took similar action following the announcement of the Reading company. Lower freight rates, they assert, would help materially in recouping anthracite losses in the Middle West. Railroads, however, have refused to consider any reduction, and the action of the Reading company apparently is to show that it is to the interest of the carriers to advocate the cuts.

Personal Notes

ROBERT P. MALONEY, Oakland, Md., formerly operating vice-president, Davis Coal & Coke Co., has been appointed assistant general manager in charge of coal-mining operations of the Dominion Steel & Coal Corporation, Glace Bay, N. S. Mr. Maloney, who recently resigned as operator member of the Maryland State Mine Examining Board and who is president of the Penker Coal Mining Co. and vice-president of the Lindsey Coal Mining Co., started in the mines as a trapper. Some years ago he was assistant general manager of the Rochester & Pittsburgh Coal & Iron Co.

ROBERT E. GALLOWAY, Memphis, Tenn., for a number of years vice-president of the Galloway Coal Co., has been elected president of the company, vice Frank N. Fisher, retired. Mr. Galloway also becomes president of the Patterson Transfer Co. and the Yellow Cab Co., both of Memphis.

JOHN A. GARCIA will sail June 11 to visit the Allen & Garcia engineering commissions at Kharkov and Tomsk, U. S. S. R. He also expects to examine some coal properties in South Manchuria, and will return to the United States in the fall.

THOMAS H. WILLIAMS, connected with the Kingston Coal Co., Kingston, Pa., for 44 years, mainly as superintendent, has been made manager of operations. O. E. HAWKINS, in the employ of the company for 20 years, has been placed in charge of the sale of coal.

JAMES E. HART, Huntington, W. Va., assistant secretary, West Virginia Coal Association, has resigned to become secretary to J. D. Francis, vice-president, Island Creek Coal Co.

W. J. WOLF, Frostburg, Md., manager Maryland division, Consolidation Coal Co., has been appointed operator member of the Maryland State Mine Examining Board, vice R. P. Maloney, resigned.

JAMES D. SISLER has resigned as associate geologist for the State of Pennsylvania to take up his duties as West Virginia State Geologist at Morgantown, W. Va., to which office he was recently elected.

HUGH J. HARLEY, Pottsville, Pa., has been appointed to the executive staff of the president of the Philadelphia & Reading Coal & Iron Co. Mr. Harley's duties will include the handling of public relations.

JAMES F. WHELAN, New York City, formerly manager of the office of the Eastern Fuel Co. in that city, has been elected vice-president and general manager of sales of the company. FRANK HOWARD has been made resident manager at Pittsburgh, Pa.

SAMUEL PURSGLOVE, Cleveland, Ohio, general manager of the Pursglove Coal Mining Co. and the Big Five Coal Co., has been elected president of the Pittsburgh Terminal Coal Co., Pittsburgh, Pa., vice HUGH T. WILSON, who resigned to devote his time to his individual interests.

W. H. HOWARTH, Brownsville, Pa., for 21 years inspector for the sixteenth Pennsylvania bituminous district, announced his retirement last month, effective July 1.

SAM HILL, Seattle, Wash., has been elected chairman of the board of the Canadian Coal & Iron Co., which recently acquired the Morden and Round Island mines on Vancouver Island, B. C.

JOHN F. MCMAHON, Chicago, for several years chief assistant on coal traffic of the Illinois Central lines, has been appointed coal traffic manager, succeeding the late Burton J. Rowe. JAMES L. LUMSDEN and BENTLY M. HAMILTON, Chicago, were appointed assistants to Mr. McMahon.

GEORGE F. CAMPBELL, Chicago, general manager of the Old Ben Coal Corporation, has been elected vice-president of the company. Mr. Campbell went with the company in 1912, and in 1923 was appointed outside superintendent. He was made general manager last year. FRANK N. BROWNING, Chicago, was appointed sales manager, vice J. W. Colliver, resigned.

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Coming Meetings

Second World Power Conference; June 16-25, Berlin, Germany.

Colorado and New Mexico Coal Operators' Association; annual meeting, June 18, at Boston Building, Denver, Colo.

American Society for Testing Materials; annual meeting, June 23-27, at Haddon Hall, Atlantic City, N. J.

American Institute of Electrical Engineers; annual meeting, June 23-27, at Toronto, Canada.

Coal Division of the American Institute of Mining and Metallurgical Engineers, Sept. 11-13, at the William Penn Hotel, Pittsburgh, Pa.

International First-Aid and Mine Rescue Contest, Sept. 16-18 at Jefferson County Armory, Louisville, Ky.

National Safety Council; annual Safety Congress, Sept. 29 to Oct. 4, inclusive, at Pittsburgh, Pa.

King Coal's Calendar for May

May 1—Consolidation Coal Co. announces wage cut of 12 to 15 per cent, affecting 2,500 to 3,000 workers in the Fairmont field of West Virginia.

May 6—Eastern railroads adopt a plan whereby they will maintain direct contractual relations with the coal producers in the purchase of railroad fuel and also attempt to keep the spread between maximum and minimum requirements taken on contracts as narrow as possible.

May 6—Tri-district convention of anthracite miners, meeting at Hazleton, Pa., adopts report of the scale committee, recommending that it be empowered to negotiate with the operators for a new wage agreement on the basis of no wage reductions, equalization of work, abolition of the contract system, a system of union dues collection, elimination of abuses, and improved working conditions. This action defeated an attempt made by John L. Lewis, president, United Mine Workers, to have the miners negotiate on the basis of the same wage scale as now in force.

May 8—Representatives of the coal industry and the heating industry meet at Chicago and adopt a resolution providing for the formation of a contact committee of ten members to facilitate interchange of information on developments in coal-burning and coal-heating equipment and further co-operation between the two industries.

May 14—Sangamon County (Illinois) Circuit Court asked to broaden injunction granted officers of District 12, comprising the State of Illinois, preventing John L. Lewis, president, United Mine Workers, from setting up a provisional government in that district and to restrain Lewis or any of his followers from acting "or pretending to act as officers of the United Mine Workers of America."

May 16—Board of directors of American Institute of Mining and Metallurgical Engineers approves the establishment of a Wyoming section of the society.

May 19—Trial of John L. Lewis, president, United Mine Workers, for alleged violation of an injunction granted by the Sangamon County (Illinois) Circuit Court, Oct. 10, 1929, enjoining him from setting up a provisional government over District 12 (Illinois), begins before Frank L. Trutter, master in chancery, at Springfield, Ill. District 12 officials win the first skirmish when Trutter holds that the trial should proceed on the question of violation of the injunction, rather than its validity.

May 21—Interstate Commerce Commission issues an order reopening the Lake cargo coal-rate case and denies petitions of the Chesapeake & Ohio R.R., Virginian Ry., Norfolk & Western Ry., and Louisville & Nashville R.R. for dismissal of the complaints brought by the Ohio Lake Cargo Coal Rate Committee and the Western Pennsylvania Coal Traffic Bureau against the Baltimore & Ohio R.R. and others. Hearing of the two complaints was set for June 16.

May 22—Representatives of the miners and operators in the New South Wales coal field of Australia reach a compromise agreement, ending the general strike which has been in progress since last fall. The original stoppage was caused by opposition on the part of labor to a wage cut.

May 28—House of Commons of the Dominion Parliament passes bill providing for the payment of a bounty of 49.5c. per ton on Canadian coal made into coke for the smelting of iron ores.

Williamson Bureau Formed

The Williamson Coal Bureau has been formed to carry out the provisions of a fair-trade-practice code adopted Jan. 14 by the Williamson operators. J. J. Ardigo, secretary, Williamson Coal Operators' Association, was made commissioner. Other officers elected at the organization meeting are: president, M. W. Stark, vice-president, Red Jacket Consolidated Coal & Coke Co., Columbus, Ohio, and vice-president, C. C. Dickinson, president, Dickinson Fuel Co., Charleston, W. Va. Members of the board of governors are: Fred Heltzman, sales manager, Old Ben Coal Corporation, Cincinnati, Ohio; J. G. Butler, Western manager of sales, Cory-Mann-George Corporation, Cincinnati, Ohio; W. A. Richards, president, Majestic Coal Co., Bluefield, W. Va.; John L. Tierney, president, Sharon Coal & Coke Co., Powhatan, W. Va.; H. G. Tildesley, president, Octavia J. Coal Mining Co., Cincinnati, Ohio; and A. E. Reilly, assistant sales manager, Leckie Coal Co., Columbus, Ohio.

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Obituary

SAMUEL BRINCKERHOFF THORNE, 57, of New York City, president of Thorne, Neale & Co., and a director of several corporations, including the Lehigh & Wilkes-Barre Coal Co. and the West Virginia Coal & Coke Co., died June 3 at the Harbor Hospital in New York City. His death resulted from the formation of a blood clot after a fall received on a fishing trip. Mr. Thorne was graduated from Yale in 1896 and engaged in business and financial enterprises in New York City, particularly with those having to do with the coal industry.

BURTON J. ROWE, Chicago, coal traffic manager of the Illinois Central R.R., died at the Illinois Central Hospital, May 12, of peritonitis. Mr. Rowe, who was 65, entered the employ of the Illinois Central in 1894, after a number of years spent with other railroads, and served as regional fuel director during the World War.

CHARLES G. MORRIS, whose last connection was as superintendent of the Clotier (W. Va.) mines of the Wheeling Steel Corporation, died May 18 at his home in Portsmouth, Ohio, after a long illness. Mr. Morris was 52.

REGINALD LANIER, 28, an official of the Norton Coal Mining Co., Birmingham, Ala., was killed May 3, while preparing a blast of liquid oxygen in a quarry at Upton, Ky., in which he also was interested.

GEORGE HARGROVE, 67, international representative of the United Mine Workers for the Alabama district, died at his home in Birmingham, Ala., May 12.

W. V. RENSFORD, 73, manager of the Hatfield-Campbells Creek Coal Co., died suddenly of heart failure May 8, while at his office at Dana, W. Va. Mr. Rensford became manager of the company in 1881.

WILLIAM G. SPEARS, president, Eagle Coal & Mining Co., died at his home in Terre Haute, Ind., May 2, after an illness of one day.

EVERETT THARP, 47, superintendent of a number of mines of the Sunday Creek Coal Co., died May 1 at his home in Columbus, Ohio, after an illness of several months.

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Earnings and Employment Decrease in March

Employment in coal mining—anthracite and bituminous combined—decreased 9.8 per cent in March, while payroll totals decreased 23.4 per cent, according to the monthly *Labor Review* of the U. S. Department of Labor. The 1,532 mines reporting had in March 308,921 employees, whose combined earnings in one week were $7,412,624. In anthracite mining in March, there was a decrease of 22.7 per cent in employment, as compared with February, and a decrease of 35.4 per cent in the payroll totals. These decreases were reported as due to market conditions. Employment in March, 1930, was 15.7 per cent lower than in March, 1929, and payroll totals were 13.5 per cent smaller.

Employment in bituminous mining decreased 3.7 per cent in March, as compared to February, and payroll totals decreased 15.4 per cent, as shown by reports from 1,380 mines, in which there were in March 224,276 employees, whose combined earnings in one week were $4,914,682. Employment in March, 1930, was 7.7 per cent lower than in March, 1929, and payroll totals were 20.4 per cent smaller.

Sound Selling Advocated For Coal Industry

The existence of unlimited reserves of coal or the indispensable part it plays in the industrial life of the country does not assure the mine operator an "adequate return" for efficient operation, asserted Walter Barnum, New York City, president, Pacific Coast Co., in a talk on "Coal Resources of the United States," made before the fourteenth annual meeting of the National Industrial Conference at the Hotel Astor, New York City, May 15. This unlimited supply, he continued, coupled with the seasonal nature of the demand for coal, puts upon the industry the responsibility for restricting output to market requirements.

Until some method of adjusting the output from the present excessive capacity to market demand is found, "no final solution for the problems of the industry can be found." Expansion of the market by coal distillation, lower mine costs, shipments abroad, and establishment of fewer and larger units of operation offer only a temporary relief as long as excess capacity is allowed to bring in its train excess production or unprofitable prices. "And excess capacity should no more be eliminated in this industry than in any other industry, particularly since in coal it is essential as insurance against peak seasonal demand."

Permanent economic rehabilitation of the industry must wait for "the voluntary adoption by operators of sound business principles which will put an end to the suicidal practice of selling their product at unremunerative prices." Technically, "bituminous mine operators have a most admirable record; on the marketing side they seem to have failed to appreciate the requirements of sound commercial practice."

Employment and Payrolls in Identical Bituminous Coal Mines in February and March, 1930

	Mines	Number on Payroll			Payroll in One Week		
		Feb., 1930	March, 1930	Per Cent Change	Feb., 1930	March, 1930	Per Cent Change
Middle Atlantic	412	67,850	67,258	— 0.9	$1,625,537	$1,556,357	— 4.3
East North Central	186	33,969	33,144	— 2.4	934,190	727,190	—22.3
West North Central	58	5,921	5,427	— 8.3	159,294	106,798	—33.0
South Atlantic	331	54,818	52,549	— 4.1	1,314,166	1,120,880	—14.7
East South Central	232	47,667	46,126	— 3.2	1,024,265	872,725	—14.8
West South Central	32	3,288	2,174	—33.9	92,466	50,851	—45.0
Mountain	119	17,763	15,978	—10.1	599,372	436,251	—27.2
Pacific	10	1,702	1,620	— 4.8	63,227	43,630	—31.0
All divisions	1,380	232,979	224,276	—0.37	$5,812,517	$4,914,682	—15.4

Per Cent Change in Each Line of Employment, February and March, 1930

	Establishments	Employment			Payroll in One Week		
		Feb., 1930	March, 1930	Per Cent Change	Feb., 1930	March, 1930	Per Cent Change
Manufacturing	13,074	3,324,315	3,307,559	— 0.6*	$88,983,750	$89,103,676	+ 0.1*
Coal mining	1,532	342,514	308,921	— 9.8	9,679,024	7,412,624	—23.4
Anthracite	152	109,535	84,645	—22.7	3,866,507	2,497,942	—35.4
Bituminous	1,380	232,979	224,276	— 3.7	5,812,517	4,914,682	—15.4
Metalliferous mining	361	59,202	58,288	— 1.5	1,779,593	1,748,343	— 1.8
Quarrying and non-metallic mining	679	32,857	34,159	+ 4.0	802,800	873,136	+ 8.8
Public utilities	10,117	727,748	727,072	— 0.1	21,764,686	22,247,085	+ 2.2
Trade	8,754	295,828	294,190	— 0.6	7,582,924	7,584,981	†
Wholesale	2,069	63,990	63,490	— 0.8	1,986,125	2,014,896	+ 1.4
Retail	6,685	231,838	230,700	— 0.5	5,596,799	5,570,085	— 0.5
Hotels	1,862	164,761	164,762	†	2,865,351‡	2,881,537‡	— 0.6
Canning and preserving	431	18,803	20,456	+ 8.8	381,074	375,695	— 1.4
Total	36,810	4,966,028	4,915,407	— 1.0	$133,839,202	$132,227,077	— 1.2

*Weighted per cent of change for the combined 54 manufacturing industries; remaining per cents of change, including total, are unweighted. †Less than one-tenth of one per cent. ‡Cash payments only.

Coal Mine Fatality Rate Less in April, 1930, Than in Preceding Month

ACCIDENTS in the coal-mining industry of the United States in April, 1930, resulted in the death of 159 men. One hundred and twenty-eight of these fatalities occurred in bituminous mines in various states and the remaining 31 were in the anthracite mines of Pennsylvania. These figures are based upon reports received from state mine inspectors by the U. S. Bureau of Mines. The death rate per million tons of coal produced during the month was 3.90 for the entire industry, based on a production of 40,776,000 tons of coal. Separated into bituminous and anthracite, the rates were 3.57 and 6.31 respectively. These rates were based on 128 deaths and 35,860,000 tons for bituminous mines and 31 deaths and 4,916,000 tons for anthracite mines.

The record for April was somewhat better than that for the preceding month of March, but it was not as good as the record for April a year ago. The fatality rate for bituminous mines for March, 1930, was 3.86, based on 138 deaths and 35,773,000 tons; that for anthracite mines was 6.59, based on 30 fatalities and 4,551,000 tons. April of 1929 had a record of 110 deaths at bituminous mines and an output of 37,380,000 tons, with a fatality rate of 2.94; anthracite mines reported 37 deaths, 6,441,000 tons, and a rate of 5.74; the combined rate for both classes of mines being 3.35 per million tons of coal produced.

Reports for the first four months of 1930 show that 714 men have lost their lives in coal-mine accidents in the United States. As the production of coal during this period was 183,628,000 tons, the death rate was 3.89. The rate for bituminous mines for this period was 3.50, based on 563 deaths and 160,966,000 tons of coal; that for anthracite was 6.66, based on 151 deaths and 22,662,000 tons. For the same period in 1929, the rate for bituminous mines alone was 3.09, with a production of 177,290,000 tons and 547 fatalities. The rate for anthracite was 5.96, with a production of 25,492,000 tons and 152 deaths, while the death rate for the industry as a whole was 3.45, based on 202,782,000 tons and 699 deaths.

One major disaster—that is, a disaster in which five or more lives were lost—occurred during the month of April, 1930. This was an explosion at Carbonado, Wash., on April 12, which caused the death of 17 men. April, 1929, was free from such disasters. During the first four months of 1930, seven major disasters with a total of 88 deaths were reported, as compared with two disasters and 60 deaths during the corresponding period of 1929. Based exclusively on these disasters, the death rate per million tons of coal produced during the 4-month period of 1930 was 0.479 as compared with 0.296 for the same period last year.

The comparative accident rates for the four-month periods of 1930 and 1929 are as follows:

Cause	1929	Jan.-April, 1929	Jan.-April, 1930
All causes	3.581	3.447	3.888
Falls of roof and coal	1.934	1.829	1.999
Haulage	.675	.671	.626
Gas or dust explosions:			
Local explosions	.082	.079	.163
Major explosions	.238	.291	.463
Explosives	.145	.133	.147
Electricity	.133	.094	.152
Miscellaneous	.374	.350	.338

Central Pennsylvania Group Attacks Coal Rates

A complaint attacking rates on coal from the Clearfield, Cumberland-Piedmont, and Meyersdale districts to Eastern destination territories and alleging violations of sections 1, 2, and 3 of the Interstate Commerce Act was filed with the Interstate Commerce Commission, May 7, by the Central Pennsylvania Coal Producers' Association, Somerset-Meyersdale Coal Traffic Bureau, and Cumberland-Piedmont Coal Traffic Bureau. Rates complained against are said to be excessive, unjust, and unreasonably high, and the complaint covers all rates on coal eastbound and their relationship, as well as the relationship between rates on coal for transshipment within and without the capes. Export coal is favored, however, the complaint offering no opposition to lower rates to tidewater transshipment piers.

Coal Mine Fatalities During April, 1930, by Causes and States

(Compiled by Bureau of Mines and published by *Coal Age*)

State	Underground												Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives	Explosions of gas or coal dust	Explosives	Suffocation from mine gases	Electricity	Animals	Mining Machines	Mine fires (burned, suffocated, etc.)	Other causes	Total	Falling down shafts or slopes	Objects falling down shafts or slopes	Cage, skip or bucket	Other causes	Total	Mine cars and mine locomotives	Electricity	Machinery	Boiler explosions or bursting steam pipes	Railway cars and locomotives	Other causes	Total	1930	1929
Alabama	2						1					3													3	5
Alaska																									0	0
Arkansas																									0	0
Colorado	1	1	1									3													3	3
Illinois	4		3	1								8	1		1		2			1				1	11	7
Indiana																									0	2
Iowa	2											2													2	1
Kansas	1											1													1	0
Kentucky	9		3									12						1						1	13	13
Maryland																									0	0
Michigan																									0	0
Missouri	1											1													1	0
Montana	1											1													1	0
New Mexico																									0	1
North Dakota																									0	1
Ohio	4		2		1		1					8													8	9
Oklahoma			2				1					3													3	0
Pennsylvania (bituminous)	14	2	5									21													21	5
South Dakota																									0	0
Tennessee																									0	4
Texas																									0	0
Utah																						1		1	1	0
Virginia	2		2									4													4	8
Washington				17								17													17	1
West Virginia	16	5	7	1	1		3		1			34							1				1	2	36	30
Wyoming	2	1										3													3	1
Total (bituminous)	59	9	25	19	2		6	1	1		3	121	1		1		2	1	1			1	1	5	128	90
Pennsylvania (anthracite)	9	6	3	3	3		2	1			3	30							1					1	31	37
Total, April, 1930	68	15	28	22	5		8	1	1		3	151	1		1		2	1	2	1		1	1	6	159	
Total, April, 1929	81	12	27		2	3	8		1		7	141						3					3	6		147

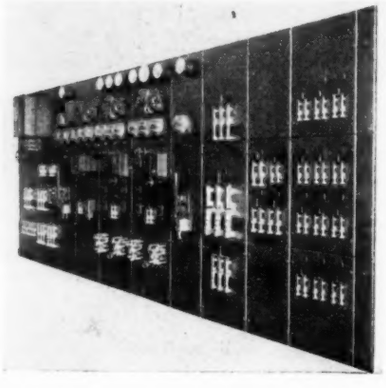
WHAT'S NEW
IN COAL-MINING EQUIPMENT

Equipment for the Use and Control of Power Offered Coal-Mining Men

SWITCHING equipment for emergency, engine-driven generators, thermostats, time switches, switchboards, resistors, photo-electric cell control equipment, magnetic reversing switches, and air circuit breakers are included in the new devices developed by the General Electric Co., Schenectady, N. Y. The switching equipment first mentioned is for use when a.c. generators are direct-connected to gasoline engines used as an emergency power source. It is mounted on standard size panels, the company says, and may form part of a switchboard which also takes care of power distribution. Either single or double unit equipments are available.

According to the manufacturer, an automotive starting unit is provided for the engine, and is energized from a storage battery which is kept charged by means of a tungar rectifier connected to the a.c. source. Therefore, when the indication is given of the failure of the normal a.c. power supply, the engine starts automatically and the generator is connected to supply emergency power. Upon the return of the power to the preferred source, the ignition system of the engine is interrupted to shut down the unit and the preferred line breaker is reclosed, restoring normal operation. Standard protective features are included.

Automatic Switchboard for 50-Kw. Installation—Two Engine-Generator Sets. Three Panels of This Board Are Involved: 4th, 5th and 6th From the Left



Mechanism for Type TSA-2A Time Switch

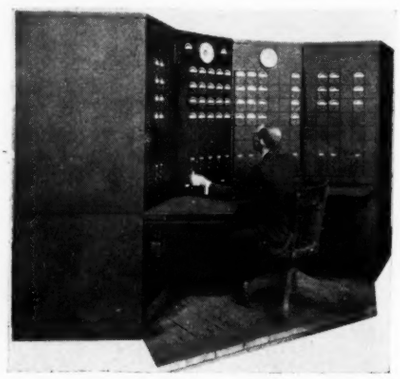
For control of industrial heating units, the General Electric Co. offers the CR-2992-A-1 thermostat in three principal ratings—60-200, 150-300, and 250-400 deg. F. Current-carrying capacity is 15 amp. at 115 or 230 volts, a.c., or ¼ amp. at the same voltage, d.c. The thermostat will operate, the company claims, with a differential of 5 per cent of the maximum temperature range.

A wide and varied application is claimed for the new automatic time switch—Type TSA—for closing and opening electric circuits at short predetermined intervals and on a uniform schedule. According to the company, it automatically energizes a circuit to control intermittent operation of electrical equipment, with a time cycle, repeated continuously of anywhere from a few minutes to several hours. As the cycle is short, the operation is without regard to the time of day, thus differing from automatic time switches with 24-hour dials. The time cycle, it is explained, depends upon the gearing used, and is fixed in each case at the factory. In certain forms, however, the relative amount of time "on" during the complete time cycle can be varied by the user.

The switches are single-pole, with one-way or two-way contacts, and are rated 5 amp. at 115 volts, or 2½ amp. at 230 volts. On circuits of higher rating, a magnetic switch may be employed in conjunction with the time switch. The contact device is driven by a Warren "Telechron" synchronous motor, said to insure accurate and reliable timing when connected to an a.c. supply having the usual well-regulated frequency.

An inclosed, miniature switchboard to control an electrical system from a central point is offered by the General Electric Co. It is made up of one or more self-contained units arranged in circular formation, said to greatly decrease the amount of space required. Each unit is completely built at the factory of welded, fabricated parts, and occupies an angular space of 30 deg., so that a total of six units may be mounted in a half circle, leaving the operator a space 4½ ft. in diameter.

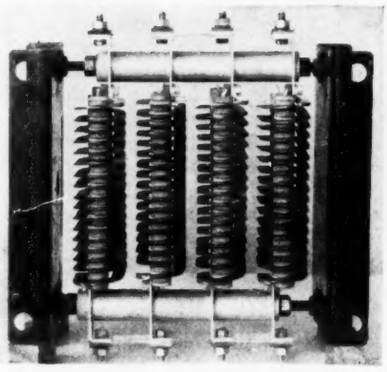
The front part of the structure consists of three sections, the upper having a large opening with vertical and horizontal welded supports. Horizontal supports are drilled and tapped for mounting the maximum number of instruments and control key panels. The lower section consists of a steel panel with a screened opening for ventilation. It is separated from the upper by a steel shelf. The rear has double doors, provided with a latch for locking. Both



General Electric Miniature Switchboard

sides of the unit are provided with holes for bushings of insulating material, for interconnecting wires, or for plugs.

Instrument indication is provided, in addition to the usual lamp indications of breaker position, and synchroscope jacks can also be mounted on control key panels where desired, the company says. Supports on each unit provide mounting for a total of 36 instruments.

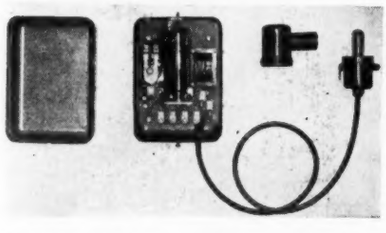


CR-9132 Edgewise-Wound Resistor—Assembly of Four Units in Series, Unit-Box Construction

exclusive of the synchroscope, each of which is 4½x4 in. The equipment is inclosed, and the wiring is inspected through a double door in the back of each unit. These doors may also be used, the company states, for mounting protective relays and watthour meters.

Easy connections to rigid terminals may be made with the new type of edgewise-wound, heavy-duty resistor, the General Electric Co. claims. This resistor—CR-9132—is of the unit-box type and is said to have the following advantages: unbreakable design, noncorrodible conductor, maximum heat dissipation, and minimum space requirements. It is mounted on a support consisting of two steel punchings held together but insulated from each other by a new form of heat-resisting molded insulator. Cleats of fired alumina insulate the resistive conductor from the support. A copper conductor, silver-brazed to each end of the resistive conductor, allows the extreme end of the resistive material to be bolted to the support. The ends of these supports, together with clamps, provide terminal connections for inter-connections and for the user's leads.

The new units are offered in the form

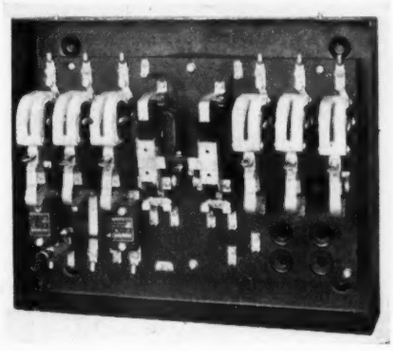


CR-7505-A-1 Photo Electric Relay Unit

of a complete line of twenty sizes, covering a current range of from 22 to 136 amp., with a corresponding resistance range of 2.5 to 0.058 ohm. Four combinations are standard: without taps, with a center tap, with taps at one-third spacing, and with taps at one-fourth spacing. Various unit-box combinations may be made up and according to the company, the use of special, molded-insulation, spacer tubes and collars in such assemblies decreases the number of pieces and simplify the assembly of the box.

For controlling an electric circuit in response to the increase or decrease in the amount of light from a given source, the General Electric Co. offers the CR-7505-A-1 photoelectric relay. It is designed, the company says, for use in industry where operations can be arranged to cause a change in light; for counting material or vehicles where mass production is involved; for sorting packages according to size, shape or reflecting power; or for the control of lighting systems according to the intensity of daylight.

Advantages listed by the company are: operation without shock or resistance to the progress or movement of the object which actuates it, or without impairing the accuracy of delicate mechanisms; adaptability to remote mounting from the equipment to be



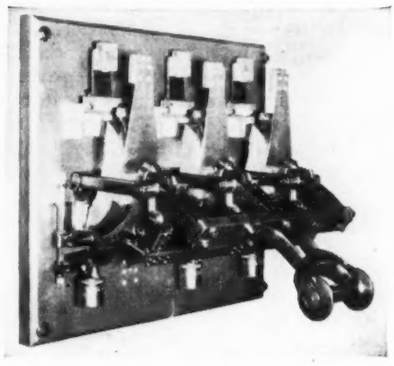
CR-7009-B-18 Magnetic Reversing Switch

controlled, thus saving space; adjustable sensitivity; adaptability to outdoor mounting; easy installation and adjustability; and high-speed operation. The standard electric supply for the relay is 110-120 volts. a.c., though it may be built, on demand, for other frequencies or voltages. A similar device for operation on direct current also may be obtained.

Ability to control motors of greater horsepower than those on which the old CR-7009-B-5 switch was used is claimed for the new CR-7009-B-18, inclosed, magnetic, reversing switch of the General Electric Co. The new device is designed to throw small a.c. motors directly across the line. It consists of two triple-pole, mechanically interlocked, magnetically operated contactors with restricted-type blowouts, and with a normally open interlock on each contactor. Two, hand-set, temperature overload relays also are provided. Ratings of the new switch are:

	Horsepower	
Volts	3- or 2-Phase 3- or 4-Wire	Single-Phase
110	7½	3
220	15	7½
440	15	10
550	15	10
600	15	10

A new line of "trip-free"air circuit breakers has been placed on the market by the General Electric Co. Advantages



Type CK-8 Air Circuit Breaker

claimed are: trip free from the handle on overcurrent; triple contact; no burning on the main brush; easily replaceable burning tips; laminated main high-pressure contact, which makes "end-on" contact with uniform, high pressure, yet easily closed with a wiping motion, and low operating temperature. The breakers are available for either instantaneous or time-delay, automatic operation in either single-, double- or triple-pole combinations with the necessary accessories. There are three classifications of breakers for voltages of 650 volts and under: Type CN-1 is a compact breaker for industrial service and circuits in buildings where the current is from 3 to 300 amp.; Type Cp-108 is a breaker for moderate-duty service rated 1,200 amp. and under, and Type CK-8 is a heavy-current breaker for moderate or heavy-duty service ranging from 1,600 amp. up.

One-Man Electric Coal Drill Is Flameproof

The Colonial Supply Co., Pittsburgh, Pa., is offering a one-man electric coal drill—250 volts, direct current—bearing the approval plate of the U. S. Bureau of Mines. It is stated that the drill has

Approved One-Man Electric Coal Drill

been in use a considerable period of time in this and other coal-producing countries, and has passed all governmental tests where testing laboratories are maintained. The manufacturer stresses the light weight (41 lb.), simple but sturdy design and ample power for the work for which it is designed. Ready accessibility for quick repairs and commendable safety characteristics are other claims made for the machine. It may also be obtained with a 500-volt winding and the same general flameproof construction, without, however, the approval of the Bureau of Mines.

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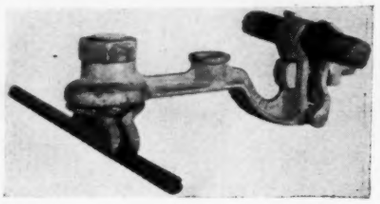
Trolley Material Designed To Cut Cost

Economy and simplification of overhead trolley construction in mines where the roof is high and irregular are two reasons given for the development of a new pipe adapted by the Ohio Brass Co., Mansfield, Ohio. This new adapter, which provides for the threading of a ¾-in. pipe at one end and a ⅝-in. stud at the other, can be furnished either with or without the stud, so that it serves two purposes. Without the stud, it can be inserted between the expansion bolt and the pipe. With the stud, one end can be screwed on the pipe, while the end with the stud engages the hanger. Using this adapter, the company states, eliminates the necessity for carrying in stock two different types, as a supply of the above type with studs will answer the problem.

Savings in material and installation labor, as well as a more efficient current feed to the trolley wire, result from the use of the new dual feeder and trolley suspension, according to the Ohio Brass Co. Utilizing only a single suspension point, it requires only one roof attachment and one insulated hanger to carry both trolley wire and feeder. The trolley wire is suspended from a clamp, while any size feeder wire

Ohio Brass Pipe Adapter



Ohio Brass Dual Suspension Hanger

from 6/0 to 1,000,000 circ.mil is accommodated. Because of its continuous metal construction, the company points out that a feeder connection is provided at each suspension point, reducing heating of the trolley wire from overload and providing the maximum current for locomotive operation. Trapping of the trolley pole in the event of a dewirement is said to be eliminated through a special design.

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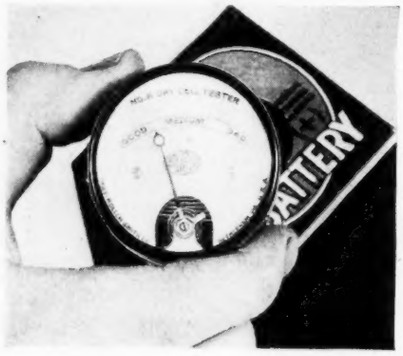
Dry-Cell Tester for Use On No. 6 Cells

The Roller-Smith Co., New York City, is now marketing the new Type BME, No. 6 dry cell tester, which is said to limit the current to about 6 amp. on a new cell, and indicate whether the cell is in good or bad condition. The



Roller-Smith BME No. 6 Dry Cell Tester

instrument is said to avoid the mistakes in testing dry cells by means of the voltage reading only, which the company says is practically valueless because the voltage of a bad cell is nearly as much as that of a good one. It also is said to eliminate short-circuiting the cell, through an ammeter, which imposes a severe drain. Sturdiness, reliability and smallness are attributes claimed by the manufacturer.

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Costs Are Said to Be Reduced By New Explosive

To do work ordinarily requiring gelatin dynamite at a reduced cost, the Hercules Powder Co., Wilmington, Del., has developed a new explosive, called "Gelamite." The new explosive, the company says, combines the safety and economy features of the high-ammonia-content dynamites with the water-resistant characteristics of gelatin, and is at the same time plastic and easy to handle. It is adaptable to either open or underground shooting.

The Hercules company also announces a ten-cap blasting machine equipped with a special hard-rubber gasket to make it moisture- and dust-proof. This machine is of the dynamo type, and fits in the pocket.

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Coal Pulverizer Offered

The Type B "Purfeco" coal pulverizer is now offered for use in power plants by the Pulverized Fuel Equipment Co., Chicago. This pulverizer, according to the company, consists of a disk and plow type feeder which extracts the tramp iron by means of a drum-type magnetic separator. Fine grinding is done with one stage of swing hammers. Coal is held in liners in the form of circular pockets, which retain the coarser particles through the centrifugal force generated by the beaters, thus, it is said, creating and combining the forces of impact and attrition. A slight air current separates the fine dust and carries it to the discharge, where it is blown through the burners into the furnace.

According to the company, the equipment is a complete firing unit, requiring but one motor for feeding, pulverizing, and furnishing combustion air. Other features noted by the manufacturer are: coal feed controlled by a graduated dial on the plow; belts or ratchets are eliminated, as well as storage of pulverized coal; fineness of pulverization may be increased by closing the air inlet at the top of the mill; and repairs may be made through doors in the housing without dismantling the mill.

Type B "Purfeco" Coal Pulverizer